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DEPARTMENT OF AGRICULTURE:  
DAIRY AND FOOD DIVISION

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BULLETIN No. 183

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PRELIMINARY REPORT

OF THE

DAIRY AND FOOD COMMISSIONER

FOR THE YEAR 1908



N. B. CRITCHFIELD, *Secretary of Agriculture*

JAMES FOUST, *Dairy and Food Commissioner*

OLIVER D. SCHOCK, *Assistant Dairy and Food Commissioner*

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Harrisburg, Penn'a., *December 31, 1908.*

Hon. N. B. Critchfield,  
*Secretary of Agriculture,*

Dear Sir: I have the honor to submit herewith a preliminary report of the Dairy and Food Division of the Department of Agriculture for the year ending December 31, 1908. It covers the operations for the year and contains such other details as may be useful for public information. I have the honor to remain,

Very respectfully,

JAMES FOUST,  
*Dairy and Food Commissioner.*

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## PREFACE.

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Owing to the fact that the full Report of the Department of Agriculture for the year 1908, containing the Reports of the several Divisions of the Department will not be ready for distribution for some weeks, the Dairy and Food Commissioner has wisely concluded to furnish the Head of the Department with the following preliminary report; and in order that the information it contains may have as speedy and wide circulation as possible, its publication as a bulletin of the Department is authorized.

A much fuller report of the operations of the Dairy and Food Bureau will appear in the regular Annual Department Report.

N. B. CRITCHFIELD,

*Secretary of Agriculture.*



# PRELIMINARY REPORT OF THE DAIRY AND FOOD COMMISSIONER.

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## PRELIMINARY REMARKS.

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The Dairy and Food Division has come to the close of another year of its history with the conviction that the situation is very much better than it has been at any period in the past. This does not mean that it has come to the end of its labors; quite the contrary. With the weapons provided it has done the best it could to enforce the laws and cultivate a sentiment in favor of honest food among manufacturers, retailers and consumers. The various agencies at its command have been employed so far as possible in an educational way, rather than for any other purpose. Even the prosecutions instituted have had information, instruction and warning in view rather than punishment for the sake of punishment. For it is a truth sometimes forgotten by those charged with the enforcement of law that many violations of its provisions occur through ignorance rather than malice. Once instruct the honest citizen who has done wrong with no evil intention and he will be found thereafter among the most faithful and obedient servants of justice. It is only among those who are governed by greed that one finds the effort to educate hopeless. Those who do not wish to be instructed in their duty can never be lifted to a higher level. Only the drastic hand of the law can teach them respect for its authority and for the rights of the public. But wherever possible the year with which this report has to do was a campaign of education concerning the dairy and food products of the State.

## THE AGE OF SCIENTIFIC DISCOVERY.

The rapid advance of scientific knowledge has brought us face to face with a new world during the last quarter of a century. In no other branch of useful knowledge has greater progress been made than in the principles of hygiene, proper sanitation and precautionary measures against the spread of disease by means of the bacilli which are at the bottom of most of the physical distress in the world and which still shorten the lives of millions annually. The surprising

discoveries which have been made within recent years concerning the nature and the cause of disease have given an impetus to various movements having for their purpose the protection of the race from infection. The result, although still far from what is yet to be looked for, has been surprisingly beneficial and is becoming increasingly so with each passing year. New discoveries are being constantly made and new precautionary measures established, so that the child born into the world in the opening days of the twentieth century has a far better chance of surviving for a life of usefulness than the one who came into the world a century earlier. For all the great and vital discoveries that have transformed the science of medicine, made a new and wonderful thing out of surgery and brought to realization many of the dreams of the earlier sages of the world's history have been made during the last century; many of them within the last quarter of a century. Men have not yet conquered death—it is not likely they ever will, or that it would be beneficial if they did—but they have succeeded in adding several years to the life of a generation and in vastly increasing the happiness and diminishing the suffering of the passing generations.

#### THE FOOD OF THE PEOPLE.

It was inevitable that increasing knowledge should lead men to ask questions about the food consumed by the people. The growth of the country, the multiplication of modern means of communication, the invention of new processes, the modern tendency to concentration, all these things affected the food of the people. Whereas in the olden and more primitive times, when there were few large towns and almost every family prepared or raised the greater part of its food, the increase of the urban population led to changed methods so that the bulk of the population now depends upon others for food supplies. Great establishments have thus arisen and the keen competition of modern business conditions has led to the invention of processes and the employment of adulterants to decrease the cost of many articles of food and to the use of preservatives of a more or less doubtful character for the purpose of retarding fermentation and preventing putrefaction. The popular craze for cheap things was also largely responsible for the rapid decline in the nutritive value of food products. Affairs soon became so bad that state after state organized for the prevention of the sale of impure food so that at the present moment the national government and most of the states are doing, what they can to improve the quality of the food products offered for sale within their respective jurisdictions. This movement was helped and hastened by the rapid advance of scientific knowledge which revealed the deadly nature of impure food and the injurious effects of many of the most popular preservatives.



## THE IDEAL STILL UNATTAINED.

In spite of increasing light and knowledge progress has been comparatively slow. There is still a cry for cheap things among the people. Some who are for various reasons living from hand to mouth are not able to purchase any but the poorest and cheapest foods. Many others who are under no such necessity do so for the sake of economy. The temptation to provide adulterated products or to use preservatives to the end that inferior products may be used is still urgent and a minority of manufacturers and dealers find it impossible to resist. They want to cater to the trade that seeks cheap things and they want to make a profit. Indeed, the profit on inferior goods is generally much greater than that on better articles. Thus far the state laws have been ineffective. The act of 1907 sought to conform the practice of Pennsylvania to that of the federal government, insisting that the policy of the State Dairy and Food Division should be conformed to the varying rules of the federal officials having authority over food and drinks and forbidding the criminal prosecution of delinquents, but providing for the recovery of fines for violation of the act by civil processes. This provision weakened the act quite as much as its other contradictory sections and rendered its enforcement very difficult. Nevertheless the Division never relaxed its efforts to keep the food supply of the people pure. How well it succeeded will be observed by the statistics which accompany this report.

## THE MONTHLY BULLETIN.

The successive numbers of the Monthly Bulletin issued during the year 1908 have been prepared with much care. They have contained the official record of the doings of the division and its agents during each month and have likewise contained several pages of editorial and other matter chiefly intended to diffuse information among venders and consumers in reference to the important matter of food products.

While it has been deemed necessary upon occasion to express decided opinions concerning controverted matters, an effort has been made to be entirely fair and nobody has been consciously attacked. In the preparation of articles dealing with existing abuses it has been the rule to mention no names. The fact that this is an official publication, representing the whole people and published in their interest, has not been forgotten so that anything that might be construed into advertising any particular business or any special house has been avoided. It is not contended that no mistakes have been made; those who are entrusted with the preparation of the successive monthly numbers of the Bulletin are human and they have perhaps blundered at times in the past. But they have striven to make it

an educational publication and have reason to believe their efforts have been crowned with a measurable degree of success. Many letters of commendation have been received from widely scattered parts of the Union and few adverse criticisms. In this and other states, manufacturers and dealers as well as private citizens have been good enough to write their cordial appreciation of many of the contents of this publication.

#### THE PEOPLE AND THE DIVISION'S AGENTS.

It is with much pleasure the fact is recorded that an increasing friendliness toward the agents of this Division is manifested by the rank and file of consumers. In the beginning this was not always so. In many instances the very persons the Dairy and Food Division was organized to benefit looked with suspicion upon its work, received its representatives coldly and put obstacles in the way rather than assist in ridding the State of adulterated or injurious food products. Many regarded the Division as a refuge for practical politicians and shut their eyes to the undoubted necessity existing for the sort of work it was established to perform. They were not conscious of the fact that much of the food on the market and consumed by themselves and the members of their families was rendered much more costly and much less nutritious by the addition of adulterants which permitted manufacturers to sell it at what seemed to be a remarkably low price. They were helped to believe that the crusade in favor of pure food and the agitation in favor of more effective laws were expensive and wholly unnecessary. It is to the credit of former officers and agents of this Division that they went forward fearlessly and patiently in the performance of their duties and succeeded in creating a sentiment that is widespread among the people in opposition to adulterated food products. It is understood now that the work of this Division is a far-reaching benefit rather than an expense to the public and the average consumer now interests himself in the enactment of more efficient laws and co-operates in their enforcement.

#### ATTITUDE OF MANUFACTURERS AND RETAILERS.

While there is a radical difference of opinion among manufacturers concerning the effect of chemical preservatives upon food products it is but fair to declare that a very large majority of the manufacturers of the country are in entire sympathy with the efforts of the State and Federal Governments to eliminate impure or adulterated food. This is also true of the retail grocers of the Commonwealth. Through their associations and by private assurances, they have manifested their hearty and intelligent sympathy with the work of this Division and have again and again rendered valuable assistance in the

work of discovering and ending the activities of the few violators of law whose efforts have been directed toward the acquirement of money at the expense of the comfort and health of the consumer. The comparative freedom of our market from injurious food products during the last two years was due not so much to the efficiency of the pure food act of 1907 as to the sterling honesty of manufacturers and the determination of retail grocers to provide nothing unfit for their patrons. While violations of law have occurred and men have been fined therefor, as the summary elsewhere given shows, yet the situation has shown wonderful improvement over past years in many respects. Too much credit cannot be given the manufacturers and retailers of this Commonwealth for the decided stand they have taken against impure or injurious foodstuffs and I am glad to be able in this public way to record the obligations of the Division to them. The exceptions have been just numerous enough to prove the rule.

#### CANNED VEGETABLES AND FRUITS.

The work of the agents of the Division, as formulated in the reports of the chemists, will be found in the statistical information at the end of this report. Of canned vegetables and fruits, 196 samples were taken and analyzed by the chemists of the Division. The result was eminently satisfactory and highly complimentary to the canners. Asparagus, beans, baked beans, beets, blackberries, cherries, corn, macaroni, mince meat, mushrooms, peaches, peas, pickles, pineapples, pumpkins, red raspberries, rhubarb, spinach, strawberries, succotash, tomatoes, were among the articles purchased by the agents of the Division and carefully examined by the chemists. As a result five samples out of the 196 were found to have been adulterated by the use of foreign substances, but in every instance the adulteration had been so minute that it was believed no case could be established, hence no prosecution was ordered. The articles adulterated were beans, mushrooms and strawberries. When one considers the large use made of the articles above mentioned by all conditions of people, in the hotel, the boarding house, the restaurant, the private family, one feels that much has been accomplished by way of protecting the public health, since the reports of the chemists demonstrate that almost the entire product of canned goods sold in Pennsylvania during the year 1908 was free from adulteration, judging from the samples lifted indiscriminately by the agents of the Dairy and Food Division, and collected in all parts of the State. This highly commendable condition of affairs emphasizes the statement heretofore made that public sentiment and growing knowledge of the effects of adulterants and preservatives has not only influenced the purchaser, but has likewise moved the manufacturer to honest efforts



to improve the quality of his goods and thus aid in the practical enforcement of proper laws. It is true one cannot say this of all manufacturers of food products; still the improvement has been marked and extremely gratifying.

#### BUTTER, CHEESE, CREAM AND MILK.

It would be difficult to mention four articles of human food that are in more constant demand than butter, cheese, cream and milk. The last is essential to the life of the race in the earlier stages of its existence and everything depends upon its quality. The tremendous infant mortality that occurs every year, chiefly during the torrid months of July and August, is almost entirely due to the quality of the milk supply. Sometimes it is unfit when sold by the dairymen. In some instances carelessness in the home results in deterioration so that it becomes poison instead of wholesome food. Milk is very sensitive to foreign influences. Some months ago the Monthly Bulletin of this Division related an incident wherein the child of a family was made violently ill soon after taking its usual meal and the milk was subjected to examination by one of the chemists of the Department. It was found to be tainted by the odor of paint and investigation revealed the fact that the kitchen in which it had been kept had been freshly painted. In this instance the fault did not lie with the milkman but with the home. Thoughtlessness or carelessness or ignorance had almost cost the family its child. This fact and similar ones which might be adduced, demonstrate the great importance of taking special pains with the milk supply from the very beginning until it has been consumed in the family. Some of the dairymen of the State become impatient with the rigid rules adopted by city health departments and others, complaining that the expense they are put to swallows up all their profit. In some respects there is ground for their impatience, but when they realize the vital importance of keeping the milk supply pure and free from poisonous substances they will probably realize that it would not be fair to their patrons to demand less care from them. The security of the community is the first matter to be considered.

It is extremely encouraging, in view of what has just been said to find that the milk and cream sold in Pennsylvania are so excellent that out of 1,813 samples lifted in many widely separated sections but 27 were adulterated. Of course that was just 27 too many, but the improvement in contrast with the condition of affairs when the Dairy and Food Division was organized is marvelous. The dairymen of the State are doing their part, as the figures show, to give the public pure milk. Their efforts should be supplemented by equal care in the home of the consumer. Already there has been a gratifying decrease in infant mortality and hundreds of valuable lives that under other

circumstances would have gone out in darkness soon after they began will be preserved, adding largely to the world's wealth in the years to come. Cream, skimmed milk and buttermilk make an even better showing. Of 754 samples of cream, 60 of skimmed milk and 8 of buttermilk analyzed by the division chemists everyone was found free from adulteration. Of 7 samples of condensed milk analyzed 2 were found to be adulterated. Taking the entire result of the examination of these samples of milk and cream one feels that much progress has been made and that the milk supply of the State has reached a very creditable condition, approaching closely to that perfection we all desire.

Quite as good a showing is made in the butter supply of the Commonwealth. Of the 770 collected and scrutinized by the chemists of the Division, all but 6 were found to be free from adulteration while all of the cheese examined was pure. Of all these articles—Butter, cheese, cream and milk only 35 samples out of 3,426 collected were found to be adulterated. It would be difficult to improve upon such a situation and yet the Division hopes to do so with the continued growth of knowledge and the advance of public sentiment until adulteration will be a thing unknown within the limits of this Commonwealth.

#### OLEOMARGARINE.

The sale of oleomargarine in Pennsylvania is not prohibited under certain conditions. The State does not prohibit its sale when it is sold as oleomargarine, stamped as such, and is not colored to resemble yellow butter, provided, licenses are procured, as required by law. If every retail dealer could be persuaded to remember and act upon this simple fact there would be no difficulty about the sale of oleomargarine. Unfortunately such is not the case; never has been the case since the manufacture of oleomargarine began. It is a much cheaper product than genuine butter, hence the temptation to color it so as to resemble genuine yellow butter and put it on the market. It may be made to resemble butter so closely that anybody save the experienced may be deceived, and as it is put on the market at a lower price than the article of which it is an imitation it usually finds ready customers among the poor as well as others who are anxious to buy their butter in the cheapest market. This not only deceives the consumer but subjects the dairymen to an unfair competition, one which he cannot successfully contend against. For his protection both the federal and the State governments have enacted legislation, not against oleomargarine as such, but against its sale as butter. Even when sold under the name of oleomargarine it is not always what it pretends to be. Thus of 50 samples collected by the agents of the Division during the year and subjected to the proper tests by the chemists, no less than 28 were found

to be adulterated while 22 were pure. This is not such a showing as would commend oleomargarine to the patronage of the careful consumer, even when put on the market under the name of oleomargarine. That the unscrupulous manufacturers of bogus butter are still hard at work trying to evade the law was evidenced by the revelations of the year, especially in the cities of Pittsburg and Philadelphia, revelations which showed the existence among the violators of law of an absolute contempt for the lives of their innocent patrons. During the year 754 samples which were bought for butter were analyzed and found to be colored oleomargarine, while 40 other samples bought for butter were discovered to be merely uncolored oleomargarine. These figures show that the trade in counterfeit butter has not been entirely suppressed although an earnest effort has been made to bring violators of the laws to justice. In many instances the federal and state officials have worked in concert, since both the federal and state laws have been violated. The agents of this Division have been uniformly instructed to put all the information gathered by them at the service of the federal representatives in this State, and, so far as my knowledge extends, they have uniformly done so. On the other hand the officers of the United States have in some instances aided the State of Pennsylvania in accumulating information necessary to the conviction of violators of law. In several instances it was discovered that the manufacturers of counterfeit butter carried on their operations in stables or cellars, filthy in the extreme. The product manufactured amid such unsanitary surroundings was either disposed of to grocers to be sold as genuine butter, or peddled around by agents of the makers. They had a regular organization and the work of detecting and breaking up their nefarious business was carried on amid many difficulties. While we are not confident that this unlawful business has been wholly broken up, we do think that the severe punishment visited upon some of the principals has gone a long way to discourage all but the most reckless. The consumer could render valuable aid to the State if he were to be a little more cautious in the purchase of his butter, looking with suspicion upon any man who offers to furnish him with butter at a figure considerably below the market price.

#### FLAVORING EXTRACTS AND ESSENCES.

Judging by the result of the chemical analysis of the specimens of flavoring extracts and essences collected by the agents of the Division there is considerable room for improvement in the manufacture of these articles. Housekeepers who use them may be of great assistance in the effort to bring about a better condition by insisting upon a careful scrutiny of the label and also demanding the best goods on the market. Co-operation of this sort will soon work out excellent



results. Of 5 samples of essence of peppermint analyzed, 3 were found to be adulterated; one sample of essence of lemon only was taken and it was pure; but of 19 samples of extract of lemon no less than 14 had been adulterated; half the samples of extract of peppermint were adulterated as was the single sample of extract of orange; all the samples of vanilla, lemon substitute and strawberry syrup were adulterated, but the 5 samples of honey were pure. Of all these products 45 samples were collected; two-thirds of the total number were adulterated. The only bright spot in the whole list is the fact that the adulteration of honey, formerly carried on upon a large scale, seems to have practically ceased. It is to be regretted that so many of the manufacturers of the essences and extracts of which so much use is now made in the family and elsewhere should be so careless or unscrupulous as to weaken the value of their products by the intrusion of adulterants. These are added for the purpose of cheapening the first cost of the product but the result is so injurious to the human system as well as so disappointing to the purchaser that every conscientious manufacturer should not only be glad to make an end of the practice, but also to use his influence to bring to justice the persistent offenders. We confidently look forward to a decided improvement in the quality of these articles during the coming year.

#### MEATS AND FISH. CANNED AND FRESH.

Under this general title is included meats and fish and their products. Of these 427 samples were collected by the Division's agents during the year. The result of chemical investigation showed that 413 were pure, while but 14 were adulterated. This is an excellent showing and is very much to the credit of those who put these products upon the market. All the samples of bacon were pure; so were all the samples of beef, including chopped, dried, loaf, potted, roasted and fresh steak. Of 23 samples of bologna, 20 were pure. Of 2 samples of potted chicken 1 was pure, the other adulterated, but the loaf chicken and the boned chicken were pure. The canned clams, the canned crab meat, were found to be without trace of adulterants. Of 103 samples of fresh Hamburg steak all but 1 were pure. Of 40 samples of canned oysters and 22 of fresh, every specimen was free from foreign substance, a very gratifying circumstance. With the exception of 5 samples of fresh pork sausage, all the samples of sausage were pure. In this connection it is not out of place to say that the Commonwealth owes a debt of gratitude to the men whose persistent agitation on behalf of pure meats and fish and their products has finally resulted in the practical elimination of adulterated and preserved products from the markets. The canned and potted meats and fish have a large sale and are an important part of the

regular diet of thousands of families. Hence it is of the utmost importance that those products should be pure and healthy. The existing situation is a very great improvement over the not distant past and the result has unquestionably been an important factor in lengthening the lives and protecting the health of a great many citizens of this State. It is to be hoped an even better record will be made during the coming year. The prospects are of the most encouraging nature.

#### MEAT EXTRACTS AND SOUPS.

Of meat extracts and soups ten samples were lifted during the year. The result is summarized in the table at the end of this report. The samples of extract of beef, clam chowder and clam bouillon were all found to be adulterated. On the contrary, the samples of rexoma bouillon, tomato bouillon, chicken soup, tomato soup and vegetable soup analyzed by the chemists of the Division were shown to be pure. If we were to draw an inference from the result of these examinations it would be that the consuming public runs no risks in the purchase of the soups just mentioned, while great risk is run in the use of the others. Thus it will be observed that a few manufacturers who persist in cheapening their products by the use of foreign substances of more or less doubtful utility bring suspicion upon their brethren who do not follow their methods. Aside from the question of insuring the protection of the consumer's health, manufacturers might well ask themselves whether the widest success in their business would not be won by scrupulous adherence to upright methods. It is true we are told by some manufacturers that they do not in anywise jeopardize the health of their patrons since the adulterants they use are perfectly harmless. Yet it will hardly be denied that these foreign substances are employed for the purpose of reducing the cost of manufacture and thus it is evident that the value of the product as a food is correspondingly decreased. So that even if it be proved that the foreign ingredients in bouillons and soups and meat extracts do really contain nothing harmful, the fact remains that the customer does not get the worth of the money he invests. Or he is deceived into believing he is getting a cheap article when in reality he pays more in the end than a first class article, free from adulterants, would cost him.

#### THE ADULTERATION OF VINEGAR.

There is absolutely no excuse for the sale of adulterated vinegar in the State of Pennsylvania. The legislature some years ago enacted a simple law concerning the manufacture and sale of cider vinegar which is intended to protect the farmers of the State and encourage them in the manufacture and sale of vinegar. Under this



law the farmer is authorized to manufacture out of the products of his orchards pure cider vinegar, and to label it accordingly. It was the thought of the legislators when they put this act upon the statute books that it would not only insure to the farmers of the Commonwealth protection in the utilization of their surplus apple crop, but likewise secure to the consumer vinegar of undoubted purity. I regret to say that events during the year have not been entirely in accordance with the hopes of the law makers and of those charged with the enforcement of this particular act. Many of the farmers have done their part but a goodly number of dealers have not been careful to assist in the desirable task of insuring a supply of wholesome, unadulterated vinegar for the use of the consumer. Here again comes in the curse of cheapness. The offer of vinegar at less than the farmers can afford to sell it has been too much of a temptation for some retailers and the result has been that a considerable quantity of adulterated vinegar is sold in the State. Of 166 samples collected at different points 75 were adulterated and 91 pure. While the pure samples were more numerous than the adulterated, the work of the agents of this Division shows the existence of a very undesirable state of affairs. Even of the vinegar purchased for apple vinegar 57 out of 127 samples were adulterated. The effect of the impure product upon the human stomach is extremely injurious. Several violators of law were prosecuted during the year and the work will be carried on with vigor in the coming months unless offending dealers turn over a new leaf.

Perhaps some of the dealers who have purchased so-called vinegar manufactured in other states and shipped into this Commonwealth have not given the matter much thought. Perhaps they have been content to accept the representations of the salesmen who have brought the matter to their attention and been deceived by the strong representations made concerning both the purity and the cheapness of their goods. Of many this is doubtless true. Nevertheless the law has been violated and those who have fallen into the trap have often been mulcted in far more than their profits on the cheaper vinegar could possibly amount to. It may be, too, that the farmer for whose benefit the vinegar law was specially enacted has not always been willing to take advantage of its provisions. Sometimes, too, he may have demanded a higher price than the article was really worth and thus turned the dealer away from him. Whatever may be the cause, too much impure and dangerous vinegar has been put on sale in this State and we must do better in the future. To this end the co-operation of farmers and grocers is invited that we may rid our State of the dangerous compounds too often sold as vinegar and supply the consumer with a pure article that will not destroy the tissues of the stomach, promote disease and shorten life

I have endeavored to emphasize this matter for the reason that it seems to be one of the danger spots still lingering in our State urgently needing to be removed. I believe nearly every grocer in the State is anxious to purchase from the manufacturer and sell to the consumer nothing that will injure the body and shorten the life. In that belief the facts are presented here and an urgent appeal made to those concerned to assist in the enforcement of a just and necessary law. This can be largely accomplished by the purchase of home manufactured cider vinegar. It may cost a little more per barrel, but it will have the advantage of being genuine vinegar and those who sell it will be obeying the law, as good citizens should.

### SOFT DRINKS.

Up to the end of the year 1908, when the report closes, this State was destitute of a law regulating the manufacture and sale of what are known as soft drinks. This Division continued the practice of collecting and analyzing samples of the drinks manufactured and sold for lemonade, soda, etc., and occasional reports of the results obtained were published in the Monthly Bulletin as well as in many of the daily newspapers of the State. This had a good effect, but many of the dealers were quite well aware that no law existed and the result was as might have been expected, the sale of very injurious preparations under innocent names. This practice was carried on at a very brisk rate during the summer months and especially in the tenement districts of our larger cities. Most of the "lemonade" sold to children and others at one cent a glass was made entirely of an injurious acid, not a drop of lemon juice being found in the mixture. The effect upon the stomachs of the habitual patrons of these establishments must have been extremely injurious. It would be an exceptional person who could use these deceptive compounds without receiving harm. By reference to the table at the end of this report it will be observed that of the 43 samples of various drinks collected and examined 23, or more than half, were adulterated. These included apple cider, birch beer, chocolate, sarsaparilla and strawberry pop, chocolate, cream, lemon, plain and strawberry soda, ginger ale, lemonade, orangeade and sarsaparilla. That is to say, it included pretty nearly everything on the list of summer drinks. As large quantities of these compounds are consumed every summer it will be readily perceived that this traffic has been one of the most pernicious and dangerous carried on in the State. The outlook for the coming year, I am glad to say, is entirely different and it is to be hoped the next report of this Division will show that this deadly business has ceased.

## CAKES AND ICE CREAM.

The 9 cakes subjected to minute examination during the year made a very good showing. Eight turned out to be pure while but a single one had been adulterated. There has arisen during the year a very serious question concerning the quality of some of the ingredients used by bakers but this is discussed in another part of this report and it is confidently believed that steps have been taken whereby the nuisance complained of will be permanently abated. In the meantime the lovers of cake may take comfort from the thought that if their cake does them harm it will not be on account of the impure ingredients.

When it comes to the question of ice cream a different condition of affairs has been revealed. Of the 26 samples collected and analyzed all but five were adulterated. Of the ice cream cones gathered 50 per cent. were impure; of the hokey pokey the single sample was adulterated; of the strawberry ice cream, 80 per cent. showed adulteration; of the vanilla ice cream 66 per cent., while 10 out of 12 samples having no distinctive name contained foreign ingredients. It is probable that the greater part of this so-called ice cream was perfectly harmless. The substances used to diminish the cost of manufacture were not poisonous. The chief trouble was that the consumer paid for ice cream and got something else. The offense in this instance, as in many others, was in the deliberate effort to deceive the public; to convince the consumer that he was getting genuine ice cream, when, as a matter of fact, he was getting a very little ice cream and a great deal of some other substance, something which he did not ask for and which he did not want. In this respect, also, there is encouragement to look for much better things during the coming year. It is to the credit of the large manufacturers of ice cream that they have taken the initiative in the work of reform.

## ADULTERATION OF FLOURS.

While but twenty-one samples of flours were analyzed by the chemists of the Division the results attained were by no means reassuring. For seventeen of these samples were found to be adulterated. Out of six samples of buckwheat four were impure; out of eleven samples of gluten flour all but one were adulterated and of the three samples of wheat flour examined only one was found free from adulteration. These figures speak for themselves and indicate a condition of affairs sadly in need of reformation. It is still true of the people of the United States that bread is the staff of life and it will be readily perceived that if the flour out of which this bread is made be adulterated the health of the consumer must be seriously affected. All that has been said of the injurious effects of adulteration of other foods applies with equal force to flour. The processes



of adulteration are employed for the purpose of cheapening the cost to the manufacture and also of permitting him to use inferior qualities of wheat in the manufacture of flour. Many experiments have been made by practical chemists, the results of which have been given in more or less detail in various numbers of the Monthly Bulletin. The judgment of the chemists is that artificially whitened flour is not healthy, the adulterants used for the purpose of bleaching the flour acting injuriously upon the human stomach, retarding the processes of digestion and otherwise harming the unconscious consumer. A great responsibility rests upon manufacturers. It is their duty to post themselves concerning the nature of the bleachers they are tempted to use and, without regard to the mandates of law, to refrain from the use of any adulterant that endangers the health of the consumer. The latter is not in a position to know that the flour from which his bread was made was bleached, and unless the conscience of the manufacturer restrain him there is likely to be serious trouble. Here in Pennsylvania we are hoping for better things.

#### SOME MISCELLANEOUS PRODUCTS.

Under this heading the statistical tables tell of 77 samples of various products that were gathered by agents of the Division during the year and examined by its chemists. Of these 49 were adulterated and 28 were found to be exactly what they were represented to be. The samples of cream puffs, egg custard, cinnamon candy, whipped cream chocolate, Italian chocolate, chocolate fudge, vanilla fudge, marshmallows, salt water taffy, Worcestershire sauce, ground mustard, were pure. All of the fourteen samples of rice were found to be impure while six samples of renovated butter were bought as pure butter. The hand of the adulterator was very busy in connection with the production of many of the articles enumerated in this miscellaneous table. The purpose was always the same—to produce an article that looked like the genuine and yet which contained sufficient foreign ingredients to cheapen the product to such an extent as to permit its sale at a very moderate figure while both the manufacturer and the retailer made a much larger profit in proportion than they obtained from the sale of the higher priced article. As has been said already the consumer is largely to blame for this condition of affairs. If he were to set his mind upon obtaining the best things, which are the cheapest, after all, he would soon discourage the manufacturers who produce and sell fictitious products and the laws of the State in this regard would enforce themselves. It will be a great day for the coming generations in Pennsylvania when every householder will insist upon being served with the best when every grocer keeps the best and when no consumer shall be compelled to purchase adulterated goods because he actually hasn't the money

to buy a better article. When that day comes the lifetime of a generation will be greatly lengthened and the massacre of innocent children will almost cease.

#### DEALING IN ROTTEN EGGS.

One of the most disagreeable revelations of the year came largely through the investigations of Special Agent H. P. Cassidy in the city of Philadelphia, when it was discovered that a regular business was carried on by certain dealers in malodorous eggs which were purchased at a nominal price and disposed of to bakers for use in their business. This nefarious and disgusting industry was fully exposed during the year by extended reference in successive numbers of the Monthly Bulletin and was practically broken up through the energetic proceedings of Agent Cassidy and other members of the Division staff. In the appendix to this report will be found a valuable paper on the subject of "Decayed or Partly Decayed and Decomposed Eggs," by Professor Charles H. LaWall, chemist and Mr. H. P. Cassidy, special agent, which gives much interesting and valuable information concerning eggs, methods of preservation and various other matters of timely interest. The details of the revolting business of the dealers in rots and spots, as the decayed eggs are called, were peculiarly offensive to the thousands of good citizens who have been shocked to learn that many of the bakers in whom they have hitherto had the fullest confidence have been using these decayed and poisonous eggs in their business. Such eggs were purchased by the pound at a nominal figure and the temptation to use them in the manufacture of cakes and pastry was too strong to be resisted in many cases. The prompt arrest of some of the more notorious offenders among the dealers in rotten eggs was followed by their submission to the mercy of the court and by the very great shrinkage of the business in this State. It contains so many elements of danger and offense that special efforts will be made by the division to guard against its revival. Reputable bakers do not patronize dealers in rotten eggs; the trouble hitherto has been that some bakers who were supposed to be beyond such conduct were unable to resist the temptation to take advantage of the opportunity to greatly reduce the cost of manufacture and correspondingly increase their profits. It is difficult to comprehend how any baker who is not utterly lost to every consideration of right and justice could bring himself to patronize the dealers in the evil mixture peddled out at a few cents a pound or the stale eggs which were sold to bakers at a nominal sum because both dealer and purchaser knew they were beyond use for any decent purpose. Since this business is so entirely disreputable and so very dangerous to the health of perfectly innocent people it does not seem harsh to demand for such dealers

the fullest publicity and the amplest punishment. The man who deliberately poisons the sources of a city's water supply is a greater criminal than the baker who poisons the food he sells to his confiding patrons, but he must have a heart no less evil and he deserves the infliction of a penalty that will bear some adequate relation to his offense and give the public some protection while intimidating others who are tempted to imitate his evil course for the sake of gain. Any adulteration of the food of the people is wrong, for the reason that it is a process of deception, but he who merely cheapens his product by the addition of a harmless foreign substance is an angel of light in comparison with the wretch who is willing to imperil the health and shorten the lives of thousands of his fellow beings. For that reason the law should lay a heavy hand upon those who sell poisoned products and who do it willingly and willfully for the sake of putting money in their purses. The sensation created by the exposures of the year has created a sentiment which will doubtless result in permanent improvement in the direction indicated. Public opinion back of a good law will accomplish much in the right direction.

#### THE RIGHT OF DEFENDANTS TO PORTIONS OF SAMPLES.

In the appendix to this report will also be found an official transcript of an important opinion handed down during the year by the Honorable Martin Bell, President Judge of Blair county, in which he discusses the question of the power of a defendant to compel the Commonwealth to share with him the sample of goods upon which the presacution for selling adulterated goods is based. It was contended by the Commonwealth that the law does not compel any such practice and the court sustains that contention. The points set forth in the opinion are quite simple and not hard to understand. It is shown that the weight of authority is against the claim that the prosecution must disclose to the defendant its line of action and the nature of the evidence it has to produce. While it is permitted in a civil action for the defendant to make a similar claim and have it allowed, this principle does not apply to prosecutions in the criminal courts. The learned court therefore holds that the contention of the defendant in the particular case under consideration that the Commonwealth must divide its samples, giving a portion to the defendant for analysis by his own chemist is without virtue and that no such principle rules. This amply sustains the ground taken by the Commonwealth in this and similar cases. It may be added in connection with this decision that the Commonwealth's action in cases of this sort is taken without passion or resentment. The Commonwealth seeks the punishment of no one and its servants heartily rejoice when an accused citizen is able to establish his innocence. The chemists of the Dairy and Food Division conduct their analysis



from an impartial standpoint, seeking only to discover the truth and to make it plain before the people. Under the circumstances, the rule of law which makes the Commonwealth the sole custodian of the evidence against the accused is just and fair.

#### SOME ACKNOWLEDGMENTS.

I wish to record here my deep personal obligation to the Hon. Edwin S. Stuart, Governor of this Commonwealth, for the uniform courtesy and patience with which he has treated this Division and for the firm and impartial manner in which he has stood for the defense of the people against the curse of impure or adulterated food. The knowledge that the first citizen of the State was giving the work of this Division his personal study was an inspiration to the Dairy and Food Commissioner and all the employes of the office to persevere in the honest effort to well and truly serve the people for whose protection the Dairy and Food Division exists. I likewise desire to acknowledge my sense of obligation to Attorney General M. Hampton Todd, and his assistants during the past year. Upon many occasions it has been necessary to consult them concerning proposed actions of the Division and in every instance great pains have been taken to be of service to the Division. My relations with the clerks, inspectors and other employes of this office have been of the most pleasant character. We have all striven to work together for the enforcement of law and especially in the direction of teaching manufacturers, jobbers, retailers and consumers that the best article is the cheapest, that adulteration of widely used food substances may easily become a crime and that obedience to law is the best policy and also the cheapest, after all. I am glad to say that while we have not yet reached perfection there are gratifying evidences of improvement in every direction, and we are hoping that the day is not far distant when the adulteration of the food and drink of the people will be an unthinkable offense. And we believe that the result will justify our faith.

#### CONCERNING THE APPENDIX.

Appended to this report will be found several papers of special interest and value. These include an opinion of Judge Bell, of Blair county, sustaining the contention of the Commonwealth that the Dairy and Food Commissioner is not compelled to hand over to the defense a portion of the food samples depended upon to prove the case of the Commonwealth; a very valuable and informing paper concerning the decay and transformation of eggs, together with comments upon the same, by Professor Charles H. LaWall and Special Agent H. P. Cassidy and a paper on the Dairy Industry of the State by Dr. William Frear, who is connected with the experiment station

at State College, is chairman of the federal commission on food standards, is frequently consulted by the national authorities at Washington, and has been so long and so closely connected with the dairy interests of this State that anything he may say will be received with unusual interest by the people of the Commonwealth, and especially by those engaged in the dairy business. It is believed these papers will be found of permanent value in connection with the work of the Division.

JAMES FOUST,

*Dairy and Food Commissioner.*

Harrisburg, Penn'a, December 31, 1908.



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# APPENDIX.

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## SUMMARY.

The following table gives a list of articles analyzed by chemists of this Bureau during the year 1908, the number of samples of each product, the number found to be pure and the number found to be adulterated.

ARTICLES.	Number of samples adulterated.	Number of samples pure.	Total.	Grand total.
CANNED VEGETABLES AND FRUITS, -----				196
Asparagus, -----		7	7	
*Beans, -----	1	16	17	
Beans, baked, -----		14	14	
Beets, -----		4	4	
Blackberries, -----		1	1	
Cherries, -----		3	3	
Cherries, Maraschino, -----		1	1	
Corn, -----		41	41	
Macaroni, -----		1	1	
Mince meat, -----		2	2	
*Mushrooms, -----	2	5	7	
Peaches, -----		2	2	
Peas, -----		34	34	
*Pickles, -----	1	8	9	
Pineapple, -----		3	3	
Pumpkin, -----		3	3	
Raspberries, red, -----		1	1	
Rhubarb, -----		1	1	
Salsada Pomodoro, -----		1	1	
Spinach, -----		7	7	
*Strawberries, -----	1	1	1	
Succotash, -----		2	2	
Tomatoes, -----		33	33	
	5	191	196	
DAIRY PRODUCTS, -----				3,426
Butter, -----	6	764	770	
Cheese, -----		7	7	
Cream, -----		754	754	
Milk, -----	27	1,786	1,813	
Milk, skimmed, -----		60	60	
Milk, butter, -----		8	8	
Milk, condensed, -----	2	5	7	
Milk and cream, evaporated, -----		7	7	
	35	3,391	3,426	
OLEOMARGARINE, -----				444
Oleomargarine, -----	28	22	50	
Oleomargarine, bought as and for butter and found to be colored oleo, -----	354		354	
Oleomargarine, bought as and for butter and found to be uncolored oleo, -----	40		40	
	422	22	444	
FLAVORING EXTRACTS AND ESSENCES, -----				46
Essence, peppermint, -----	3	2	5	
Essence, lemon, -----		1	1	
Extract, lemon, -----	14	5	19	
Extract, orange, -----	1		1	
Extract, peppermint, -----	1	1	2	
Extract, strawberry, -----	2	1	4	
Extract, vanilla, -----	1		1	
Honey, -----		5	5	
Lemon substitute, -----	1		1	
Strawberry syrup, -----	7		7	
	31	15	46	

\*The above table shows five samples to have been adulterated, but the adulterant substance was in such minute quantities as to make it impossible to establish a case; hence, no prosecution was ordered.

## SUMMARY—Continued.

ARTICLES.	Number of samples adulterated.	Number of samples pure.	Total.	Grand total.
MEATS AND FISH, CANNED AND FRESH, -----				427
Bacon, canned, -----		1	1	
Bacon, fresh, -----		1	1	
Beef, chopped, -----		1	1	
Beef, dried, -----		1	1	
Beef, loaf, -----		1	1	
Beef, potted, -----		1	1	
Beef, roasted, -----		3	3	
Beefsteak, fresb, -----		9	9	
Blood pudding, -----		1	1	
Blood cheese pudding, -----		1	1	
Bologna, -----	3	20	23	
Cased blood tongue, -----		1	1	
Chicken, boned, -----		5	5	
Chicken loaf, -----		2	2	
Chicken, potted, -----	1	1	2	
Clams, canned, -----		2	2	
Crab meat, canned, -----		4	4	
Corned beef, -----		9	9	
Corned cod, -----		1	1	
Deviled crabs, -----		3	3	
Deviled ham, -----		3	3	
Fish cakes, -----	2		2	
Frankfurters, -----		4	4	
Ham, fresb, -----		5	5	
Ham, boiled, -----		2	2	
Ham, potted, -----	1	4	5	
Hamburg steak, fresh, -----	1	102	103	
Herring, -----		1	1	
Liver pudding, -----		2	2	
Lobster, -----		8	8	
Mackerel, -----	1	2	3	
Meats, potted, bam flavor, -----		8	8	
Meats, chopped, -----		2	2	
Meats, potted, no flavor given, -----		2	2	
Oysters, fresb, -----		40	40	
Oysters, canned, -----		22	22	
Pork chops, -----		1	1	
Pork, sboulder, -----		1	1	
Quick pate truffled, -----		1	1	
Salmon, canned, -----		20	20	
Sardines, French, -----		9	9	
Sausage, smoked, -----		4	4	
Sausage, half smoked, -----		7	7	
Sausage meat, -----		1	1	
Sausage, fresb pork, -----	5	81	86	
Sausage, lunch, -----		1	1	
Sausage, Vienna, -----		6	6	
Shrimps, -----		8	8	
Shredded codfish, -----		1	1	
Tongue, beef, -----		1	1	
Turkey, boned, -----		1	1	
MEAT EXTRACTS AND SOUPS, -----	14	413	427	10
Extract of beef, -----	3		3	
Clam chowder, -----	1		1	
Clam bouillon, -----	1		1	
Rexoma bouillon, -----		1	1	
Tomato bouillon, -----		1	1	
Chicken soup, -----		1	1	
Tomato soup, -----		1	1	
Vegetable soup, -----		1	1	
VINEGARS, -----	5	5	10	166
Vinegar, amber, -----	1		1	
Vinegar, apple, -----	57	70	127	
Vinegar, dark, -----	1		1	
Vinegar, distilled, -----	7	1	8	
Vinegar, fermented, -----		1	1	

## SUMMARY—Continued.

ARTICLES.	Number of samples adulterated.	Number of samples pure.	Total.	Grand total.
Vinegar, malt, -----		2	2	
Vinegar, red, -----		2	2	
Vinegar, spirit, -----	1		1	
Vinegar, syrup, -----		2	2	
Vinegar, white, -----		1	1	
Vinegar, white, distilled, -----	1	1	2	
Vinegar, white wine, -----		1	1	
Vinegar, no brand given, -----	7	4	11	
	75	91	166	43
*SOFT DRINKS, -----				
Apple cider, -----	1		1	
Birch beer, -----	3	1	4	
Coco cola, -----		1	1	
Chocolate pop, -----	1		1	
Sarsaparilla pop, -----	1		1	
Strawberry pop, -----	2		2	
Chocolate soda, -----	1		1	
Cream soda, -----	2	1	3	
Lemon soda, -----	3	2	5	
Plain soda, -----	1		1	
Strawberry soda, -----	4	1	5	
Ginger ale, -----	1	1	2	
Lemonade, -----		8	8	
Nectar, -----	1		1	
Orangeade, -----	1	3	4	
Root beer, -----		2	2	
Sarsaparilla, -----	1		1	
	23	20	43	9
CAKES, -----				
Coffee, -----		1	1	
Cheese, -----		1	1	
Dandy cream, -----		1	1	
Jelly, -----		1	1	
Pound, -----		1	1	
Sponge, -----		1	1	
Sunshine, -----		1	1	
No name given, -----	1	1	2	
	1	8	9	26
ICE CREAMS, -----				
Cones, -----	2		2	
Hokey Pokey, -----	1		1	
Strawberry, -----	4	1	5	
Vanilla, -----	4	2	6	
No flavor given, -----	10	2	12	
	21	5	26	77
MISCELLANEOUS PRODUCTS, -----				
Bread, Butternut, -----	2		2	
Cream puffs, -----		2	2	
Custard, egg, -----		2	2	
Candy, cinnamon, -----		1	1	
Chocolate, whipped cream, -----		1	1	
Chocolate, Greenfield's Italian, -----		1	1	
Fudge, chocolate, -----		1	1	
Fudge, vanilla, -----		1	1	
Marshmallows, -----		1	1	
Taffy, salt water, -----		1	1	
Catsup, tomato, -----		1	1	
Sauce, Worcestershire, -----		1	1	
Coloring compounds, strawberry, -----	1		1	
Coloring compounds, vegetable, -----		1	1	
Eggs, opened and in the shell, -----	22	8	30	
Jelly, Rex fruit, -----	2		2	
Lard, -----	2	5	7	

\*As no law existed regulating the manufacture and sale of soft drinks, prosecutions were not instituted, but as a result of the above investigations the Legislature of 1909 passed an act regulating the manufacture and sale of this commodity.

## SUMMARY—Continued.

ARTICLES.	Number of samples adulterated.	Number of samples pure.	Total.	Grand total.
Mustard, ground, -----		1	1	21
Rice, -----	14		14	
Renovated butter, bought as and for butter, -----	6		6	
FLOURS, -----	49	28	77	
Buckwheat, -----	4	2	6	
Gluten, -----	10	1	11	
Glutosac, -----	1		1	
Wheat, -----	2	1	3	
	17	4	21	

## FINANCIAL STATEMENT.

## STATEMENT OF JAMES FOUST, DAIRY AND FOOD COMMISSIONER, SHOWING RECEIPTS AND EXPENDITURES.

## RECEIPTS.

Oleomargarine licenses, .....	\$33,190 25
Oleomargarine fines, .....	10,490 31
Pure food fines, .....	5,909 50
Vinegar fines, .....	2,455 00
Renovated butter licenses, .....	1,608 34
Milk fines, .....	313 22
Renovated butter fines, .....	294 00
Meat fines, .....	200 00
Fruit syrup fines, .....	120 00
	<hr/>
	\$54,580 62

## EXPENDITURES.

Attorneys, detectives and assistants, .....	\$22,392 96
Special agents' salaries, .....	16,394 00
Chemical and laboratory expenses, .....	13,186 19
Traveling and agents' expenses, .....	12,156 33
Clerical and stenographers' salaries, .....	5,838 72
	<hr/>
	\$69,968 20

All the receipts of the office are paid into the State Treasury for the use of the Commonwealth and the Bureau is maintained by an appropriation made by the Legislature.

## CASES TERMINATED.

Selling oleomargarine; no license, .....	30
Selling oleomargarine; colored, .....	68
Selling oleomargarine; colored and no license, .....	7
Selling renovated butter; no license, .....	4
Selling oleomargarine for butter, .....	16
Selling adulterated cream, .....	3
Selling adulterated milk, .....	15
Selling adulterated (skimmed) milk, .....	2
Selling adulterated catsup, .....	41
Selling adulterated candy, .....	3
Selling adulterated codfish, .....	3
Selling adulterated olive oil, .....	9
Selling adulterated blackberry jam, .....	1
Selling adulterated chocolate, .....	1
Selling adulterated buckwheat, .....	1
Selling adulterated vinegar, .....	47
Selling adulterated apple cider, .....	1
Selling adulterated Hamburg steak, .....	3
Selling adulterated ginger ale, .....	1
Selling adulterated preserves, .....	1
Selling adulterated strawberry syrup, .....	1
Selling adulterated jelly, .....	2
Selling adulterated gluten flour, .....	1
Selling adulterated flour, .....	4
Selling adulterated bologna, .....	1
Selling adulterated rice, .....	2
Selling adulterated bouillon, .....	1
Selling adulterated sausage, .....	4
Selling adulterated chopped meat, .....	1
Selling adulterated frankfurter sausage, .....	2



Selling adulterated mace, .....	2
Selling adulterated extract of beef, .....	1
Selling adulterated extract of peppermint, .....	1
Selling adulterated extract of lemon, .....	5
Selling adulterated extract of vanilla, .....	1
Selling misbranded breakfast food, .....	10
Selling misbranded "Butternut" bread, .....	1
Selling eggs unfit for food, .....	3
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Total, .....	300

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## THE DAIRY INDUSTRY IN PENNSYLVANIA.

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By Dr. William Frear.

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In reviewing the condition of any industry it is important to consider the improvement in methods, materials and products, the various kinds of products and by-products made, the economic conditions, such as cost of production, changes from domestic to factory manufacture, demand and supply markets, competing industries, and related legislation. The data at command are too meagre to make possible so exhaustive a discussion of the Pennsylvania dairy industry. All that can be attempted, with present information, is to suggest for consideration certain important facts bearing upon the principal points mentioned. These, it is believed, will be of interest, at this time, in view of the approach of the next decennial census.

### EARLY IDEA OF DAIRY FARMING CONDITIONS.

There was a time, not many years past, when it was believed that only well watered states rich in sweet-grassed pastures could produce milk advantageously; when milk, butter and cheese were the only marketable dairy products; when the production of milk was regarded as a constant element of all farm operations, and the markets for milk and butter were sought only in the immediate localities where these articles were produced.

## CHANGED CONDITIONS OF PRODUCTION.

Within a few decades all this has been changed. The introduction of the silo, the wide-spread adoption of the soiling system, and the introduction of large amounts of cereal and oil-seed by-product feeds into all farming localities, have been followed by the extension of dairy farming into the great middle west. Domestic production of milk products has largely given way to centralized factory manufacture. Cheap transportation has made the west a powerful rival of the east in Eastern markets. Improved methods of management, together with the use of refrigerator cars and ships, has made it possible to carry both milk and butter from Chicago to Paris and return them in sound condition. The city child drinks milk to-day that was yesterday taken from herds four hundred miles distant.

## NEW MILK PRODUCTS.

The dairy products marketed are no longer confined to milk, cream, butter and cheese. Pasteurized milk has come to the front for city consumption. Certified milk, with low bacterial content, is recommended by the family doctor. Condensed milk, evaporated milk and sweetened condensed milk made where and when milk is cheap and abundant, appear as rivals of fresh milk wherever the supply is scarce and the price high. Ice cream, twenty years ago a rarely consumed luxury, is now an article of daily use, and is sold as ice cream whether made from cream, condensed milk, condensed skim milk, milk or even skim milk. Milk powders made by evaporating whole milk to dryness form a considerable element of production, especially for use in infant foods. Buttermilk is known not only in the spring-house on the farm, but has grown to be a favorite beverage at most city bars, and kephir and kumys prepared by fermenting cow's milk, are becoming well known. Milk sugar, still limited in use, is now made from skim milk as well as from whey, and dried curd produced from skim milk has found a growing value as an important ingredient of various adhesive and stiffening preparations.

## RELATIVE POSITION OF PENNSYLVANIA AS A DAIRY STATE.

In the middle of the last century, Pennsylvania had an enviable reputation as a dairy state, rivaled only by New York. To-day she has other competitors, and exceeds at no point of the industry except that of market value, every other State. Nevertheless, she still belongs to the galaxy of the principal dairy states of the Union. According to the late national census the dairy industry exhibited a higher degree of specialization in Pennsylvania than in any other of the great dairy states except New York. For while the total number of cows was smaller in Pennsylvania than in these other states, except Ohio and Minnesota, the number of dairy farms *i. e.* such as



derived their principal income from the sale of milk products, was greater than in any other State except New York, and the average Pennsylvania cow far outclassed her western competitors in the volume of milk she annually produced. Furthermore, she exhibited a greater improvement during the preceding decade than did the cows of the competing western states, and from 1900 to 1908, Pennsylvania increased her number of cows more than any western dairy state except Wisconsin. Pennsylvania ranked third in the total production of milk by states, second in the value of dairy products, third in the total quantity of butter produced and in that produced on farms, but only fifth in that produced in factories, and fourth in cheese production.

Moreover, the average value of the Pennsylvania dairy farm product sold exceeded that of every other principal system of farming in the State. Viewed with respect to the influence of the system of farming upon the fertility of the land, no system of large extension is so favorable to the increase of fertility as a well conducted dairy system, both because it lends itself to the most careful conservation of domestic manures, and leads, especially where butter is the chief product sold, to the least removal of valuable elements, but also because it brings to the farm in the grain foods purchased, a large store of available plant food to add to the original supply.

For all these reasons, as well as for the economic and sanitary advantage of the great industrial and urban population, Pennsylvania may wisely do all in her power to develop and improve her dairy industry.

#### PENNSYLVANIA'S CONSUMPTION OF DAIRY PRODUCTS.

Let me pause for a moment to consider the demand of the State for dairy products. In 1900 the population was 6,300,000, the earning members of whom, to the proportion of eighty-six per cent. were engaged in non-agricultural occupations. The Bureau of Labor and Commerce in the study of expenditures of wage-earning and low salaried men in the State, found that the average family of 4.88 persons spent annually for milk \$20.25; for butter, \$30.49 and for cheese, \$4.00; making a total of \$54.74 for these dairy products. This is equivalent to an annual retail value for the dairy products consumed by the entire population of 69 million dollars, or for the non-farming population of 59 millions.

The figures of the last census show further that the farm value of milk and butter were greater in Pennsylvania than elsewhere. One other economic factor of importance is apparent, namely, that the per capita demand for dairy products is increasing, so that the future of well managed dairy farming is full of promise of good markets.

## FARMING AREA OF PENNSYLVANIA.

Pennsylvania has an area of nearly 29 million acres. In 1900, 44.8 per cent. of this area, or thirteen million acres was improved; one-fifth of the area, or nearly six million acres was occupied by permanent pastures, farm wood lots and abandoned farms; while one-third, or nearly ten million acres, was composed of mountain land, or occupied by bodies of water, cities, railways, etc. Part of the rough land is used for pasturage, but not where dairying is extensive. That is to say, while there is still some unoccupied land fit for dairy purposes, the State must look rather to the enlarging of the carrying capacity of her present improved lands rather than to an increase of total farm acreage for the maintenance of the increasing number of acres requisite to supply her growing population with the indispensable nutriment contributed by the dairy farm. Likewise, the highest intelligent effort must be directed toward the most complete conversion of the grain and forage crops by the average cow into milk.

## NUMBER AND DISTRIBUTION OF MILCH COWS IN THE STATE.

Looking further into the details of the industry's development, with reference to the production of the basic material, milk, we find that in 1899, Pennsylvania had 943 773 cows, of which less than one-third were kept on her 32,600 dairy farms; and that the average farmer kept 3.9 cows, while the dairy farmer kept 8.9 cows; in other words, the average farmer not making dairying a specialty, kept 3.9 cows, and the dairy farmer only two and one-half times as many. The experience of the industrial developments of the past century has demonstrated that radical improvements in complex industries is secured only by specialization. Unless, therefore, the conditions essential to such specialization of dairying are secured and maintained, we can look for only a very gradual improvement in the milk yield of the individual cow.

The widely varying nature of her lands, and the great difference in the diversity and occupations of the population in different districts of Pennsylvania, has resulted in widely different developments of the dairy industry in the several regions of the State. Thus in 1899, the average farm in Delaware county had 9 dairy cows; in Chester county, 7.6 cows; while in Fulton the number was 2.6 in Forest, 2.7, and in Juniata, 2.8.

## IMPORTANCE OF THE INDIVIDUAL COW.

The ruling factor in the success of the dairy industry is the producing quality of the average cow. Failure to conceive this fact and to give it due attention, means the failure of the system, and a corresponding privation of the entire population. In 1899, the average Pennsylvania milch cow produced 516 gallons of milk. In this

respect, the different localities of the State showed wide differences. The highest average yield was in Montgomery county, namely, 619 gallons; whereas, in Fulton, Huntingdon, Potter and Sullivan counties it was less than 450 gallons. There was no close relation between the producing value of the average cow and the average size of the farm herds in the several counties.

These figures for the yield of the average cow afford room for serious reflection on the part of the economist, and even more on the part of the dairy farmer, because they show the room for and imperative need of the improvement of the average cow, an improvement that can be gained only by the unremitting application of the highest skill to the breeding, feeding and care of the individual cow, and this means a degree of attention to the qualities of the individual member of the herd that she has never received.

#### IMPROVEMENT OF OFFSPRING.

Stop one moment to consider the fact that the average bull kept on the Pennsylvania farm in 1899 was valued at only \$23. How can we secure in the succeeding generations of milch cows, the desired producing qualities if we persist in inflicting upon them a transmission of one-half blood from sires of so low worth?

#### COST OF MILK PRODUCTION.

There are few satisfactory balance sheets of receipts and expenditures available for a study of the profits of the industry in Pennsylvania; but the few accurately compiled statements at hand grimly admonish us of the need for attention to the individual cow. Parker and Cooper, in a recently published investigation of the cost of producing Minnesota farm products, state the cost of maintenance, and the total net value of product per cow for a large number of Minnesota herds, as follows:

COST.	Average of all.	Average of a good herd.	Average of a poor herd.
Grain, -----	\$6.890	\$6.565	\$4.371
Roughage, -----	10.280	14.302	7.598
Pasture, -----	4.920	6.000	4.120
Labor, -----	17.038	18.932	11.623
Interest on investment, -----	1.846	3.878	1.297
Total cost, -----	\$40.974	\$49.677	\$29.009
Value of product, total, -----	50.950	69.970	28.860
Value of product, net, -----	9.976	20.293	—149



It may be noted that in this statement there was on the one hand no allowance for the cost of shelter of the cow, nor, on the other, for the value of the manure produced.

Goesmann calculated that the average cow of the selected herd at the Massachusetts Experiment Station yielded, during a single year, 12.33 cents per day above the cost of feed and the depreciation in value of the cow and that of this gross profit, 3.25 cents was in cash and 8.81 cents in manure.

Lane, studying the excellent herd at the New Jersey Station, where the soiling system and the silo are in use, found that 25 cows yielded milk at a cost of 1.394 per quart for food, or of 2.19 cents for food, labor and interest; and that at a selling price of 3 cents per quart, the profit based on the prices ruling in 1899, would be \$24.54 cash and 10.6 tons of manure, whereas, if the price obtained for milk were only \$1.00 per hundred pounds the dairyman would have for profit only the manure. Lane further calculated that to make her profitable under the conditions obtaining at Newark, the cow must yield at least 574 *gallons of milk*.

If this were true of the average Pennsylvania conditions of production, the average cow of this State would be kept at a loss, more especially if the cost of shelter were added to the statement of expense.

#### CAPITALIZATION OF DAIRY FARMS.

In this connection it is of interest to note the average investment of the average Pennsylvania Dairy farmer, exclusive of working capital. In 1899, he had a farm of 86 acres of which 63 acres were improved, with \$3,217. His buildings were worth \$1,782, his implements \$289, and his livestock \$641. His total investment in these items was \$5,929. No estimate of his working capital is available. His annual expenditure for hired labor and for fertilizer was \$135. The value of his products not paid to livestock was \$889, besides house rent, less taxes, depreciation and interest, and the principal part of his table expense. That is to say, the gross receipts from outside the farm, were equivalent to 15 per cent. of the total fixed investment, other than working capital,—an amount superior to that obtained that year by the average hay and grain, vegetable, fruit, or livestock farmer of the State.

#### EXPERIENCE IN HERD IMPROVEMENT.

In the foregoing paragraphs, the narrow margin of profit afforded by the average cow has been emphasized. The experience of numerous dairy farmers has shown that by the careful selection of sires from productive strains, by the weeding out of the less productive

animals, and by proper feeding and management, herds of grade stock cows within two or three generations, may be made to yield fifty per cent. more milk, or an average annual amount of 6,500 pounds and upwards per cow.

A record sheet for the individual yield at each milking, with a convenient set of pails and spring scales for quick weighing and a composite sample to be analyzed every two or four weeks at the neighboring creamery, will afford most dairy farmers the simple and inexpensive means of obtaining an accurate estimate of the producing qualities of the individuals forming their herd.

The Swedish plan, whereby a large group of dairy farmers associate in the employment of a skilled feeder, milk tester and keeper of records,—a plan under which Swedish dairy farms have greatly prospered—offers a valuable suggestion to our own dairymen. Such skilled men are now being prepared by the agricultural schools of the country, so that their services are available so soon as the organized demand shall arise.

#### THE SILO AND THE SOILING SYSTEM.

The last decade has witnessed a marked increase in the adoption of the silo and of the soiling system as part of the Pennsylvania dairy-farm management, and has greatly increased the possible milk yield per acre of farm land, since by this system the rough food and most of the grain required by a cow can be raised upon a well managed half-acre; while the older system, involving large pasturage areas, required about three acres per cow. The silo is not most profitable, it is true, where the number of cows is small. Farms with small herds can, however, by the proper use of root crops, secure a cheap, succulent food well suited to milch cows; but where herds are largely ruminant, experience has shown the silo to afford the cheaper food.

#### LOSS BY INCOMPLETE MILKING.

Other points of herd management likewise require closer attention than they are receiving. In a recent article, Mr. Larson, of the Pennsylvania State College, writes of the great average loss due to incomplete milking, an amount equal to nearly 70 gallons of milk in a lactation period.

#### THE MILKING MACHINE.

Lack of a satisfactory labor supply and the consequent long hours, summer and winter, that a dairyman must give to his business, has deterred many from entering the business and discouraged others

already embarked upon the enterprise. The experiments made with the recent types of milking machines offer hope of relief at these points.

#### CONDITIONS OF LEASE-HOLDS UNFAVORABLE TO DAIRYMEN.

In a recent conference of men interested in the dairy development of various districts of the State, it was stated that the conditions of the lease-holds were often such as to discourage tenants from increasing their herds and from feeding them in the best way, since no allowance is made for manure value of grain foods purchased, the building of silos is not encouraged, and the leases often contain clauses restricting the number of animals that may be kept on the farm, without respect to the fact that the carrying capacity of the farm can be greatly increased, and without loss of fertility, but rather with a gain therein, by the substitution of a well-managed soiling system for the pasture system under which the clauses in question were necessary. In view of the facts that one-fourth of Pennsylvania farms are tenant-farms, and one-third of the milch cows of the State are kept on these farms, the criticism mentioned deserves serious consideration. Allowance could fairly be made in the cash results after the plan used in parts of England and Scotland, where the manure value of the foods purchased and fed on the farm are estimated and deducted from the rents, according to a sliding scale, year by year, until there is no further probable residual effect of the manure upon the productiveness of the land. A similar allowance could be made in cases where the lease is on the crop-sharing plan.

#### DEVELOPMENT OF THE FACTORY SYSTEM.

No survey of the dairy industry can be fairly complete which fails to take into account the relation of the factory system to the system as a whole. In Pennsylvania, as elsewhere in the Union, the creamery and cheese factory have revolutionized dairy farming, and transferred the manufacture of butter and cheese from the farm home to some neighboring specialized seat of industry. While this change began early in the State, it has progressed less rapidly than in some of the western states; for in 1900 only one-third of the butter produced in Pennsylvania was manufactured by creameries, while over one-half the butter product of Iowa and Wisconsin was so made.

The number of creameries and cheese factories of the State more than doubled from 1890 to 1900. The increase is still continuing, though no list of these establishments so revised as to be entirely trustworthy, is at command to afford a satisfactory basis of judg-

ment respecting the present rate of increase. The average farmer has been much benefited by the development of the creamery system since the quality and price of the butter has been distinctly improved by the factory methods,—although the product from a few most skilfully managed farm dairies is still the most excellent, for the creameryman's raw material can be no better than the average among his patrons, and can never equal the best. Alvord has conservatively estimated that the farmer's profit by gain in price of the creamery product—on the average butter made and more advantageously marketed—is 1.8 cents per pound or over 11 per cent. of the average farm price; and there are many indirect advantages in addition.

#### DAIRY FACTORIES IN PENNSYLVANIA.

In 1900 there were in the State, 619 creameries and 140 cheese factories. These had an average investment of capital to amounts, in round numbers, as follows: Land, \$200; buildings, \$1,200; machinery, tools, implements, &c., \$1,700; cash, sundries, &c., \$1,000; total, \$4,100; an amount superior, especially in point of equipment, to that of the average creamery of the middle states and of the United States.

Of these factories, comparatively few remained in the first form of co-operative associations, over one-half belonging instead to individuals, nearly one-fourth to partnerships, and about one-eighth to unincorporated companies.

Only a small fraction of the creameries had outlying separators or skim-milk stations, and in most cases the patrons delivered milk to the creamery instead of the latter collecting cream from the dairy farms.

#### CREAMERY OPERATIONS.

The average creamery spent \$12,691 for raw material and containers and manufactured \$15,105 worth of products, thus securing \$2,414 of gross profits out of which to pay wages, depreciation and interest upon investment.

#### NUMBER OF COWS REQUIRED BY AVERAGE CREAMERY.

The average creamery required for its consumption about one and one-third million pounds of milk and nearly 6,000 pounds of cream. That is, the average creamery in Pennsylvania required the entire milk yield from a few more than 300 average Pennsylvania cows; a low number, because the average annual output of the Pennsylvania creamery is barely 60,000 pounds of butter, as compared



with more than 71,000 pounds in the average creamery of the United States. The low output of the Pennsylvania creamery undoubtedly causes an increased cost of production for each pound of butter made; and both dairyman and creameryman is benefited by the development of an abundant milk supply within easy hauling distance of the creamery.

#### BUTTER RATIO.

In these days, little improvement in the output of butter per pound of butter-fat in the milk can be looked for, as the creameries in general have well learned the proper use of the centripetal separator and the management of temperatures during churning, while the average butter-maker is not yielding far to the temptation to so manage his processes as to incorporate in his butter, the highest quantity of water it can be made to carry, in order that the consumer may pay butter prices for water. On the average, according to Alvord, one pound of butter required 22 pounds of milk. Assuming the average over-run, this implies an average fat richness of nearly four per cent. for the creamery milk supply.

#### IMPROVED QUALITY OF BUTTER SOUGHT.

The principal lines of effort in creamery management are in the direction of improving the quality of the product. The last meeting of the State Dairy Union devoted a large part of its program to the discussion of the value of cream starters to this end. The competitive butter tests conducted by the Pennsylvania State College are awakening much interest and should prove valuable in promoting skill and care in this feature of creamery work.

#### CHEESE FACTORIES.

The northern section of the State, while it has no great city population, has a large proportion of milch cows and is, therefore, an advantageous region for the development of the cheese industry a product made almost exclusively in the factory. In 1900, Pennsylvania had 140 cheese factories, each of which used about 700,000 pounds of milk during the summer months, at a cost of approximately \$5,150. The average value of the product was \$6,400; leaving for gross profit, the sum of \$1,250.

#### CONDENSED MILK AND ICE CREAM FACTORIES.

The condensed milk and especially the ice cream manufacture, have very markedly increased during the past decade, and we will await with interest the returns of the next census in relation to these industries.



## DAIRY SANITATION.

In neighboring states much attention is being devoted to the sanitation of dairies and creameries, and a considerable body of legislation has been enacted relative to this subject. In this State, though the Dairy Union, has favored an educational movement to improve the sanitary conditions of production, no laws dealing exclusively with the subject have been enacted. The matter is one deserving the thoughtful and unselfish consideration of both producer and consumer.

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THE TRADE IN DECAYED EGGS KNOWN AS "ROTS" AND  
"SPOTS" AND THEIR EMPLOYMENT IN FOOD PRODUCTS.

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By Charles H. LaWall and H. P. Cassidy.

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In view of the recent interest manifested in the subject of decayed eggs and their use in food products, an attempt has been made to collect information relative to the matter, much of which, while well known to the members of the trade, has not previously appeared in a published article.

An egg, in the common acceptation of the term, is the ovum of the feathered biped known as the domestic hen, a member of the gallinaeous family, and undoubtedly derived by domestication from the jungle fowl, *Gallus bankivus*, of India. It is termed fertile or infertile, according to whether or not it contains an embryo.

That the egg of the hen is meant when no qualifying term has been used, has been legally decided in a case in one of the western states, where duck eggs had been supplied when eggs were ordered, and in which a law suit followed a refusal to accept and pay for the eggs. The decision of the judge stated that if any other interpretation were allowed than that of the hen's egg, where the word egg had no qualifying term, it would be possible to substitute canary bird or pigeon eggs, or any other egg, and that there would be no protection to the dealer or consumer in case of contracts made in advance.

From time immemorial eggs have been used for food purposes by man and the trade in eggs in civilized countries has assumed enormous proportions since the development of rapid transportation and cold storage.

The egg consists of a number of complex organic constituents, but as popularly considered, it may be divided into three portions, *i. e.*, shell, egg white (generally called the albumen of the egg), and egg yolk. The average weight of a hen's egg is a little over two ounces, of which one-tenth is the weight of the shell, the latter consisting almost entirely of calcium carbonate, identical in composition with chalk. Of the remainder of the egg, or of the whole substance of the egg as commonly used, two-thirds is albumen or white and one-third is yolk. It is commonly supposed and is a popular error, that the white of the egg is the most nutritious portion, but the following figures, showing the percentage of composition of the egg, will illustrate the incorrectness of this view.

Weight of the whole egg, .....	100 parts.
Dry proteid matter in egg white, 8 parts.	
Water in egg white, .....	52 parts. 60 parts.
Dry proteid matter in egg yolk, 5 parts.	
Fat in egg yolk, .....	10 parts. 30 parts.
Water in egg yolk, .....	15 parts.
Weight of egg shell, .....	10 parts.

It will be seen by the above table that the white of the egg, while preponderating in amount in the whole egg, contains a far greater amount of water than the yolk, which in addition to some proteid matter contains a large amount of fat, part of this being a very nourishing constituent known as lecithin containing phosphorus in a highly assimilable form.

An egg is adulterated within the meaning of the law when it is in a decomposing or decomposed state, as it then consists "wholly or in part of a filthy, decomposed or putrid substance," which is one of the legal definitions of adulteration as applied to food products.

The recognized food value of eggs is not without justification, although the food elements are not such as to be adapted for what is known as a "balanced ration" for a normal individual in a state of health, as that element known as carbohydrates is entirely lacking, but when eggs are used in a mixed diet this element is commonly supplied by bread or some form of cereal food.

The term fresh eggs, as commonly understood, applies to eggs which have not been kept long enough to cause any alteration either in the consistency of the yolk and white or in the flavor. The terms "fresh," "fresh laid" and "strictly fresh" have been given varying interpretations and meanings by those who sell eggs, but all of these terms should be restricted to eggs which are of recent origin, and should under no circumstances be applied to storage eggs, which are decidedly inferior in flavor and in food value, and which should be

plainly designated as such when sold, in order that the purchaser may know what he is getting.

Many methods have been suggested for the home preservation of eggs in such a manner as to retain their good qualities intact. The principle underlying all of these preserving processes is in keeping the air from the egg contents by coating the shell or by immersing the egg in some protective solution in order to prevent the loss of water by evaporation and also to prevent the entrance of germs and mould spores, which are easily able to penetrate the shell by means of the natural pores.

Among these methods may be mentioned immersing the eggs in a solution of brine or in a solution of sodium silicate or in lime water; packing dry in bran, peat dust or wood ashes; or by plunging the eggs in boiling water for 15 seconds, whereby a thin film of coagulated egg white forms next to the shell; coating the eggs with a solution of sodium silicate, shellac or some other solution which leaves a varnish-like film is also recommended.

All of these methods have been found to result in only about 50 per cent. of the eggs, at best, being fit for food purposes at the end of seven or eight months, and in addition to this large percentage of loss, the remaining eggs in some cases, as in preservation with brine or sodium silicate solution, have acquired a disagreeable flavor which unfits them for many uses.

A recently described method for preserving eggs, which is claimed to give results so satisfactory that eggs six months old may be poached and are otherwise indistinguishable from fresh laid eggs, is as follows: The eggs are first placed in a vacuum and then immersed in melted paraffin wax, which thus enters the pores of the shell upon admission of the atmospheric pressure and hermetically seals it. Evaporation of the egg contents, which is responsible for much of the alteration seen in storage eggs, is thus prevented, and if the process is properly carried out, the egg remains in practically a sterile condition until used.

Properly applied, cold storage seems to be the best method by which eggs may be preserved for some months and still be fit for food purposes. It has been found that the temperature at which the eggs are stored has a great deal to do, not only with the keeping quality of the eggs while in storage, but also with the length of time they will keep after being removed from storage. A temperature of from 31 degrees to 34 degrees F. seems to give the most satisfactory results in practice. Eggs which have been stored at a temperature of 30 degrees or below must be used immediately after removal from storage, while those stored at temperatures of from 32 degrees to 40 degrees will keep for a considerable time after removal to normal temperature.



The changes which eggs undergo in cold storage are almost entirely due to conditions brought about by the porosity of the shell, whereby water is lost by evaporation of the egg content, thus favoring the growth of micro-organisms which penetrate the shell and start putrefactive changes. The loss of moisture by evaporation from eggs when standing, either at ordinary temperatures or in cold storage is so decided and such a constant factor that the age of an egg may be approximately ascertained by its deviation from the normal average specific gravity, found in the fresh egg to be 1.090, while after thirty days' keeping the figure is reduced to 1.035. The actual loss of weight at the end of thirty days is about 5 per cent. at ordinary temperatures. At cold storage temperatures the loss is more gradual but just as certain, and at the end of one year the loss is ten per cent. A difference between cold storage and fresh eggs is noted in the relative weights before and after boiling. Fresh eggs lose in weight upon being boiled, while cold storage eggs appreciably gain in weight.

If eggs in storage are turned at least twice a week to prevent the yolk from adhering to the shell, the proportion of eggs that spoil can materially be reduced, as the point from which the area of infection proceeds in an egg technically known as a "spot" egg, is the point at which the yolk has begun to adhere to the lining membrane of the shell.

In sorting storage eggs for purposes of selection of those which are sound and fit for food purposes, the operation known as "candling" is resorted to. This is done by workmen who are skilled in the art of selecting rapidly and unerringly the good eggs from those known technically as "rots" and "spots" respectively. An egg which is classified as a "rot" is one in which the decomposition has proceeded so far that the egg content is no longer differentiated into yolk and white, but is one homogeneous mass of putrefying material, sometimes fluid but often semi-fluid or even solid. "Rots" are divided into "red rots" and "black rots," according to the color of the egg contents. Such an egg may or may not have present the gases hydrogen sulphide and hydrogen phosphide, which are mainly responsible for the disagreeable odor of a decomposing or rotten egg. The presence of these gases is positive evidence of the decomposition of the egg, as they are liberated when the complex proteids containing sulphur and phosphorus are broken up by putrefactive changes. After a time these gases escape and the egg content becomes almost inodorous, although greatly changed in its appearance as well as in its chemical composition. In China, duck eggs are sometimes buried in the ground and allowed to remain for years; total decomposition ensues, the gases rupture the shell and escape

into the soil where they become absorbed. The eggs are then dug and used for food purposes, being esteemed a great delicacy by the orientals.

An egg which is known as a "spot" egg is as previously stated, one in which there is a localized point of infection, usually characterized by the adherence of the yolk to the lining membrane of the shell, and which upon close examination, is found to be accompanied by the presence of an active growth of a micro-organism, usually one of the more resistant *fungi*. A "spot" egg is also one in which incubation has begun. In its early stages, a "spot" egg upon opening, has an appearance as though the yolk had been partly cooked where it adheres to the lining membrane of the shell. Later this spot becomes black and mould spores are readily recognized upon microscopic examination. Such an egg always possesses a characteristic, usually disagreeable odor, and is not a wholesome article of food. Chemical and physical examinations of the remaining egg content show a splitting up of the proteid compounds normally present with the liberation of new and frequently poisonous organic bodies.

Candling, as actually practiced, consists in observing the appearance of the egg, viewed by transmitted light when held against a bright flame. A candle may be used, but an incandescent light is more frequently employed in the larger establishments, and when the operation is carried on in a dark room where the only light proceeds from the one that is used for the examination of the eggs, a skilled workman can handle and separate the eggs into their various classes as rapidly as he can pick them up and handle them.

A normal or fresh egg, when observed by transmitted light under these conditions, shows an almost uniformly illuminated appearance, shading slightly from the darker center occupied by the yolk. A "rot" is recognized at once by its opaque, almost black appearance throughout, while a "spot" is readily known by the dark localized area at one particular point against the inside of the shell. An egg which has been in storage for more than six months can readily be recognized by the expert candler, as the air space is much larger and rapidly changes its position as the egg is moved around before the light, due to the greater fluidity of the egg content. When the egg has been in storage from 7 to 9 months it has acquired a degree of fluidity which renders the separation of the yolk from the white of an unopened egg almost impossible, and if such an egg in the whole state be agitated, it will be found upon opening that the white and yolk have become almost entirely blended. This is not true of a fresh egg, in which the most violent agitation usually fails to produce any mixture of the yolk and white. This condition of affairs would



indicate that certain obscure chemical or perhaps biological changes take place in eggs which have been stored, as in the absence of any such changes it would be fair to assume that the egg content should become thicker as it loses water upon evaporation, while the facts show that the reverse condition is true.

Upon opening and examining fresh and storage eggs, side by side, it will at once be noticed that in a fresh egg the white possesses a characteristic appearance and a consistency approaching a gelatinous condition, and that the yolk rises prominently above the surface of the white when the contents are opened in a deep, narrow vessel. A storage egg, on the other hand, shows a condition of greater fluidity in the white with almost entire absence of the previously mentioned gelatinous condition, and that when the egg is opened into a deep, narrow vessel, the yolk sinks down in the white so that the top is little, if at all, above the surface. It will also be noted that in the fresh egg the yolk membrane is so tough that separation of the yolk from the white is readily effected, while in a storage egg the yolk membrane is so tender that it ruptures upon the slightest handling, and separation of the yolk from the white is almost impossible without contamination of one with the other.

In wholesale quantities, eggs are handled and stored in crates containing thirty dozen each. These crates are made of white odorless wood, and the partitions separating the individual eggs as well as the layers, are of the kind of pasteboard known as strawboard.

It is well known that the porosity of the egg shell permits the absorption of various odors by eggs which are stored near strongly odorous substances. When shipped or stored they must be kept away from anything which would be liable to communicate its odor to them. Even the strawboard used for partitions is sometimes the cause of an abnormal taste and odor in storage eggs. A cracked egg will readily and quickly decompose and thus set up an active infection of all the surrounding eggs in a crate if not immediately removed.

When eggs are stored in a damp place they soon acquire a musty flavor and begin to mould. The ideal way to preserve eggs would be to lay them on trays of sand in a cold dry room, temperature about 33 degrees Farenheit, and to turn the eggs over two or three times a week, to prevent the yolk from adhering to the shells, and thus starting a spot, from which infection will rapidly proceed. Under present conditions, however, eggs are stored for long periods in the ordinary crates with practically no attention until they are removed from storage, when they are candled and classified according to their condition, as good eggs, cracked eggs, rots and spots.

The sale of good stored eggs and of cracked eggs, for food purposes, is of course legitimate, when sold for precisely what they are, and

when there is no attempt to deceive the consumer, but the sale and use for food purposes of rots and spots, as has been practiced in the large cities (particularly in Philadelphia and New York) for many years, is both unwarranted and unjustifiable. There is a legitimate use to which these decomposed and decomposing eggs may be put, and that is in the treatment of certain kinds of leather in the tanning industry.

The first handlers of the eggs who separate them by candling, usually attempt to justify and protect themselves by having stenciled on the crate of rejected eggs "*not to be used for food purposes*" but when, as is so frequently done, they are sold either directly to baking establishments or to middlemen who make a practice of preparing them for the baking trade, their use undoubtedly constitutes a distinct menace to the health of the community, and as the complex proteid and lecithin constituents of the egg naturally develop ptomaines and similar poisonous substances upon undergoing putrefactive changes, and as such poisonous ptomaines are not destroyed by the ordinary baking temperature, there is little doubt that many obscure cases of food poisoning are attributable to the use of these decomposing eggs by bakers.

It is almost incredible that such filthy and unwholesome products as putrefying eggs should be used by baking establishments, but the financial gain is so great that a certain class of bakers (which fortunately is rapidly decreasing) use these eggs in their products. In Philadelphia, upon several occasions, eggs which were in advanced stages of decomposition have been traced to and seized in the baking establishments where their use is customary.

The condition in which they are handled and sold is in bulk, the whites and yolks being mixed together by beating up the entire mass in large cans. The separation of the eggs from the shells is effected by hand, the operator picking out the "spot" and allowing the remainder of the egg to fall into the can, where it is subsequently mixed with the rest of the mass. To the contents of the can formaldehyde or borax is sometimes added, to check any further decomposition, and condensed milk is often added to give a certain creamy, homogeneous appearance which is possessed by normal egg contents.

The justification, if there is any, for continuing in this trade, is probably ignorance on the part of the middleman or egg openers, as illustrated by the argument recently advanced by one of these men, to the effect that a "spot" egg is like a partly rotten apple, and that after the removal of the rotten portion the remainder of the egg is wholesome. Even if the egg contents thus obtained were wholesome, which they decidedly are not, the unsanitary conditions under which the eggs are opened and handled, usually in dark, filthy cellars, by per-

sons who have absolutely no regard for hygienic details, would be sufficient to condemn them for food purposes.

As might readily be inferred by a knowledge of the material and the conditions under which it is prepared, the egg contents thus collected are not at all uniform either in appearance or in flavor. A slightly rotten flavor and odor is said to bake out entirely in using egg contents in which hydrogen sulphide or hydrogen phosphide have developed, while a distinctly musty flavor is noticeable in the baked product and such egg contents are rejected by the bakers. Among other varieties of abnormal flavors and odors may be mentioned the following, which are self-explanatory: kerosene, mouldy, sour, herring, camphor oil and onion.

In large bakeries the necessity for competently judging of the probable effect upon the baked products has led to the employment of expert tasters, who receive salaries sometimes as high as twenty or thirty dollars a week, and upon whom devolves the duty of tasting, either in the raw state or in a trial cake, each lot of opened eggs submitted, in order to prevent the use of eggs which would communicate a flavor to the finished product, and thus prevent their sale. It is said that the employment of musty eggs is recognizable in passing a bakery where such eggs are being used, and that with the exception of the camphor oil or kerosene flavors, or of musty eggs, all of the various flavors will bake out and give a product which is practically normal in its appearance and flavor.

The use of dried eggs and of frozen egg contents, even though prepared, as is sometimes the case, from good eggs at seasons when the price is very low, usually dangerous from the fact that the dried egg requires such a long time for solution with water or milk to bring it to the consistency of normal egg contents as to usually undergo putrefaction to a greater or less extent, by the time it is used. In the case of frozen eggs, the rupturing of the cellular structure by freezing is accompanied by an increased tendency to decomposition after thawing, and unless such eggs are used very promptly after bringing to the warm temperature of the bakery, the changes which the mass undergoes are undoubtedly almost as marked as in the egg contents previously described as being obtained from "spot" eggs.

Of egg substitutes, there are none which are equivalent in food value or for cooking purposes, to fresh egg contents. They are usually composed largely of farinaceous or starch materials, frequently colored with coal tar color. The use of coal tar color in cakes and other baked articles, to give the appearance of a product in which eggs have been used, is not uncommon, and is unjustifiable in that it tends to deceive the purchaser by giving an unwarranted appearance of richness.

In conclusion, it may be said that if cold storage eggs be sold for



exactly what they are, and if the rejected "rots" and "spots" be used either for purely technical purposes or else destroyed, the spirit as well as the letter of the law will be complied with, and it will be for the benefit of the public, for the protection of whom food legislation is enacted.

### THE TURNING OVER OF SAMPLES.

An important opinion of Bell, J., Blair county, in the case Commonwealth *vs.* J. A. Koller, *et al*, in re. rule to show cause why portions of samples taken by the Commonwealth should not be turned over to defendants for analysis.

#### IN THE COURT OF QUARTER SESSION OF BLAIR COUNTY.

Commonwealth

*vs.*

J. A. Koller *et al*.

In re. rule to show cause why portions of sample taken by the Commonwealth should not be turned over to defendants for analysis.

BY THE COURT: "So far as the rule for a bill of particulars is concerned, as ruled by the Supreme Court in Commonwealth *vs.* Powell, 23 Sup. Ct. 372, a bill of particulars in a criminal case is not a matter of right, but is only an appeal to the sound discretion of the court. My recollection is that in some of the pure food indictments in cases tried in this Court there was simply an allegation in the indictment that the pure food act had been violated, without specifying the particular violation. I am inclined to think that that indictment was perfectly good. We have our act of Assembly which provides that an indictment shall be deemed sufficient which simply follows the words of the act of Assembly, and if this indictment had simply followed the words of the act of Assembly, and been in the general form with which we found other indictments we would feel it but right and proper that the Commonwealth should specify the particular article of food which was supposed to be adulterated and at least specify in a general way how that particular article of food was adulterated; but in the present instance the particular article of food is specified, to wit, chocolate, and there is a general statement as to how it is adulterated. I think we will all agree on a moment's reflection that the rulings of the appellate courts on this subject are perfectly right and proper. The authority cited by Mr. Baldrige is not an analogous authority at all. In the first place, as stated by Mr. Woodward, the physical examination to which the plaintiff is compelled to subject himself is always made—and I am speaking only as to the orders of—is always in the presence of the physician of the plaintiff. I have drawn frequent orders compelling plaintiffs in damage cases to submit to physical examinations, but I was always careful to provide that the physician of the plaintiff should be present so that no unfair advantage could be taken of the plaintiff, and that everything that was done there was done in the presence of the physician of the plaintiff. But it seems to me that the endeavor to liken a civil proceeding to a criminal proceeding is fallacious, and that is the vice of the offer. In a civil proceeding the plaintiff may be compelled to subject himself to a physical examination. At the same time he has the mutual and co-ordinate right of compelling defendant to disclose his case. Not so in a criminal case. The defendant can hold all the papers in his possession, and there is no power to compel him to produce them. He can sit on the witness stand and say I have a paper at home, and the Court is powerless to make him produce evidence to establish his guilt. That is one reason. In the second place a civil suit is tried on the weight of the evidence. Each party comes in with an equal right to be heard as to the measure of proof, but in a criminal suit the burden is on the Commonwealth to establish the case beyond a reasonable doubt and these maxims of ours about the reasonable doubt that the jury must come to the firm, unwavering conviction that the defendant is guilty, have come to us from times when judges were wont to hang a man for stealing a loaf of bread. Now I do not say in the present criminal procedure that we should get away from these old maxims, but I do say that while we adhere to those old maxims, which we adopted when they hung men for stealing a loaf of bread, such maxims ought not to be applied against the Commonwealth on the one side and then on the other hand the Commonwealth be compelled to disclose all their case, and the absence of precedent to my mind



is strong proof that there is no warrant for a court compelling the Commonwealth to submit their evidence in advance to the defendant. It does seem to me that the able criminal lawyers who have defended criminals charged with grave offenses if there was any warrant for such a precedent would have brought it in force. Take for instance a murder case. The Commonwealth claiming that they found on the prisoner a bloody shirt, and that the blood stains are human blood, not chicken blood, or blood which he received butchering a hog, but human blood; now we all know that the experts on the part of the defense coach the lawyers for the defense while they cross examine the experts of the Commonwealth, but I do not think there would be any warrant for a defendant charged with murder to say you must tear that shirt in two and you must give my chemist one-half of the alleged blood stains so that they can prepare a defense; or, to put it more mildly, that they can have the alleged blood stains analyzed. I do not know of any such precedent, and the very fact that Mr. Baldridge, after diligent search, has been unable to find one to my mind is proof that there is no warrant to force the Commonwealth to produce the evidence they are going to submit. As I said before, in a civil suit, under certain equitable rules, each side must apprise the other side of what evidence they are going to use, but I do not think it would be fair to say to the Commonwealth you must give the defendant all your side of the case so that he can examine and ransack it, and at the same time allow the defendant to keep his mouth shut. It seems to me that would be giving a defendant an unfair advantage, and it seems to me it would be unfair to compel the Commonwealth to allow a defendant to subject their samples to examination in advance, and I will overrule the application for the compelling of the production of such samples. As to experiments in open court I do not know to what extent I will go about a matter of that kind. I did rule in the formaldehyde cases where Mr. Hicks wanted to take a drink of the preservative, and wanted the Court to take a drink of it, and let the jury take a drink of it, I did rule that he could take a drink, but the Court would not, and would not have the jury do so. Mr. Hicks was going to turn the Court into a laboratory, and I think we said we would not have any laboratory here in court. I do not know to what extent I would go if there was an effort on the part of the defendant to examine samples by microscopic tests—I will leave that matter open."

I hereby certify that the foregoing is a correct transcript of the opinion of the Court in the case of Commonwealth *vs.* J. A. Koller *et al.*, in re. rule for turning over of portion of sample taken by Commonwealth.

J. F. MECK,  
*Official Stenographer Courts of Blair County.*

# LIST OF CREAMERIES IN PENNSYLVANIA AS PUBLISHED BY THE PENNSYLVANIA LIVESTOCK BREEDERS' ASSO- CIATION.

- Adams Co.  
Bermudia, ..... B. D. Hostetter  
Cashtown, ... Cashtown Creamery Co.,  
L. W. Swartz, Manager  
East Berlin, E. Berlin Creamery Assn.  
East Berlin, ..... J. D. Hershey  
Gettysburg, ..... Jerry J. Plank  
Guernsey, ..... John Geiger  
Latimore, .... Latimore Creamery Co.,  
Jos. Lerew, President  
New Oxford, ..... J. Diller & Co.  
Allegheny Co.  
Wilkinsburg, .. Bright View Dairy Co.  
Armstrong Co.  
Cochran's Mills, ..... Cochran's Mills  
Creamery  
Dayton, .... Dayton Co-op. Creamery  
Assn.  
Top, ..... King & Woodward  
Whitesburg, .... Whitesburg Creamery  
Blaney & Sons, Props.  
York Springs, ..... B. D. Hostetter  
Beaver Co.  
Hookstown, ... Hookstown Creamery  
Bedford Co.  
Rainsburg, ..... George Morgart  
Berks Co.  
Bally, ..... Frank Janson  
Bechtelsville, James Moyer and Bro.  
Berne, ..... Levi M. Miller  
Bernville, .... Ahrens & Richardson  
Bernville, .... Bernville Creamery Co.  
Bethel, ..... Ahrens & Richardson  
Bowers, ..... Bowers' Creamery Co.  
Boyertown, ... Grimm's Mill Creamery  
Boyertown, .... Boyertown Creamery  
Calcium, ..... Calcium Creamery  
Calcium, ..... Cleaver & Hoffman  
Clayton, Clayton Butter & Cheese Co.  
Crosskill Mills, Ahrens & Richardson  
Douglasville, ... Charles Buckwalter  
Eshback's, ..... Hines Bros.  
Exeter Station, .. H. B. Levan & Co.  
Fleetwood, .... Fleetwood Creamery  
Fleetwood, ..... Daniel Kelchner  
Hancock, ..... Hancock Creamery  
Hamburg, ..... N. A. Coufer  
Huff's Church, ..... Nathan Leshner  
Kempton, ..... M. L. Ritter  
Kempton Station, Howard G. Kimmel  
Excel'r Dairymen's Assn.  
Klinesville, .... Klinesville Creamery  
Kutztown, .... Kutztown Creamery  
Landis' Store, .. Joseph Boyer & Bro.  
Lenhartsville, ..... B. F. Levan  
Lime Kiln, ..... Oley Line Creamery  
Little Oley, ..... Fritzer's Creamery  
J. P. Thomas, Prop'r  
Lyons Station, ..... Jno. G. Haring  
Manatawny, .. Pleasantville Creamery  
Mertztown, ..... F. Moyer & Co.  
Mohrsville, ..... Isaac S. Fraunfelder  
Morgantown, ..... Jacob Hartz  
Morgantown, .. Morgantown Creamery  
New Berlinville, Gilbertville Creamery  
New Berlinville, .... Congo Creamery  
New Berlinville, ..... W. H. Moyer  
New Jerusalem, ..... J. S. Henrich  
North Heidelberg, .. Klapp & Kalback  
North Heideberg, ... Klopp's Creamery  
Obold, ..... Kalbach & Obold  
Oley, ..... Freidensburg Creamery  
Oley, ..... Hartman & Bros.  
Reading, ..... Franklin St. Creamery  
Reading, ..... St. Lawrence Creamery  
Reading, ..... Spang & Zacharias  
Rehrrsburg, .... Ahrens & Richardson  
Rehrrsburg, .. Rehrrsburg Creamery  
Shartlesville, ... Ahrens & Richardson  
Shoemakersville, .... Shoemakersville  
Creamery  
Stonersville, .... Ahrens & Richardson  
Straustown, .... Ahrens & Richardson  
Topton, ..... A. S. Heffner  
Upper Bern, ..... Levi M. Miller  
West Leesport, ... Samuel H. Lenhart  
& Son  
Windsor Castle, ..... M. L. Ritter  
Yellow House, ..... Amos Hartman  
Yellow House, ..... Home Creamery  
Blair Co.  
Tyrone, .... Hoffman Bros. Creamery  
Henrietta, ..... Elmer S. Berget  
Bradford Co.  
Alba, ..... Alba Butter Mfg. Co.  
Allis Hollow, Allis Hollow Creamery  
Co.  
Allis Hollow, Union Creamery Co., Ltd.  
Austinville, ... Austinville Co-operative  
Creamery Co.  
Brad, ..... Wyalusing Creamery  
Cadis, ..... J. W. Prince  
Camptown, ..... Fuller & Blocker  
Canton, ..... Odee Creamery Co.  
Canton, ..... Glenside Creamery  
Columbia Cross Roads, ... Austinville  
Creamery Co.  
Coryland, ..... Coryland Creamery  
Durell, ..... Durell Creamery  
East Canton, Silverdale Creamery Co.  
East Smithfield, ..... D. A. Stephen  
East Troy, East Troy Butter Mfg. Co.  
Grover, ..... S. S. Vermilya  
Le Raysville, ..... W. B. Stevens  
Milan, .... Pennsylvania Creamery Co.  
Minnequa, ..... James Ketcham  
Myersburg, M. Butter and Cheese Co.  
New Albany, New Albany Creamery  
Co.  
North Orwell, ..... George Pennell  
North Orwell, ..... Baker Brothers  
Potterville, ... Potterville Creamery Co.  
Potterville, Orwell Creamery Co., Ltd.  
Smithfield, ..... Stevens Creamery  
Sayre, ..... Harkness Creamery  
South Warren, .... Best and Wheaton  
Stevensville, .. Stevensville Association  
Troy, ..... S. H. Heywood  
Bucks Co.  
Argus, ..... C. T. Hixon  
Bedminster, .... Bedminster Creamery  
Bedminster, ..... J. F. Hulsheiser  
Bedminster, ..... J. F. Kilmer  
Bedminster, ..... Moyer & Hulsbiser

## Bucks Co.

Blooming Glen, ..... Blooming Glen Creamery  
 Blooming Glen, ..... Pleasant Springs Creamery  
 Buckingham, Blooming Valley Creamery

Buckingham, Blooming Valley Dairy-men's Assn.

Bucksville, ..... Kaiser & Kramer  
 Bursonville, ..... Hixon & Mills  
 Carversville, ..... Carey Betz  
 Carversville, ..... C. Roberts  
 Chalfont, ..... Chalfont Creamery  
 Chalfont, ..... A. H. Faust & Co.  
 Church Hill, .. Church Hill Creamery  
 Church Hill, ..... Jos. Guldin  
 Cressman, ..... Milton H. Hickle  
 Danborough, ..... Ottsville Creamery  
 Doylestown, .. Cold Spring Dairy Co.  
 Dublin, ..... Dairy-men's Assn.  
 Erwinna, ..... George Scott  
 Forest Grove, Forest Grove Creamery  
 Gardenville, ..... Gotwals & Son  
 Geryville, ..... Krausdale Creamery  
 Jamison, Warwick Township Creamery  
 Keller's Church, .. Wilson S. Atherholt  
 Levin, ..... Frank Hetrick  
 Makefield, ..... Makefield Creamery  
 Milford Square, .... Henry G. George  
 Milford Square, ..... A. H. Moyer  
 Neshaminy, ..... W. W. Carr  
 Nockamixon, F. M. Moyer Via Ferndale  
 Nockamixon, .. Nockamixon Creamery  
 Ottsville, ..... Aaron Leatherman  
 Passer, ..... J. H. Shelly  
 Perkasio, ..... Henry O. Moyer  
 Pipersville, ..... A. M. Gerhart  
 Pleasant Valley, .... Dimlin & Gerhart  
 Pleasant Valley, ..... J. H. Shelly  
 Plumsteadville, .. Plumsteadville Cream Assn.

Quakertown, ..... C. T. Hixon  
 Quakertown, ..... William S. Taylor  
 Richlandtown, Keller's Church Cream.  
 Richlandville Centre, .. Landis & Moyer  
 Richlandtown, Richlandtown Creamery  
 Shelly, ..... Henry B. Weiss  
 Solebury, ..... Solebury Dairy Assn.  
 Spinnerstown, ..... Dairy-men's Assn.  
 Springtown, ..... Hixon & Mills  
 Steinburg, ..... O. H. Erdman  
 Tohickon, ..... J. D. Stover  
 Trumbanersville, ..... Sinking Springs Creamery

Wisper, ..... Union Dairy Association  
 Zion Hill, ..... Henry B. Weiss

## Butler Co.

Conoquenessing, ... Stern & Dumbaugh  
 Portersville, ..... H. Oliver  
 Portersville, Portersville Creamery Co.  
 Prospect, ..... Prospect Creamery Co.  
 Saxonburg, Saxonburg Elgin Creamery  
 Slippery Rock, Slippery Rock Creamery Co.

## Cambria Co.

Carrolltown, ..... Farmer's Creamery

## Carbon Co.

Little Gap, ..... W. M. Benninger  
 Centre Co.

Bellefonte, ..... Rock Farms Creamery  
 Bellefonte, .... Howard Creamery Cor.  
 Howard P. O., ..... C. M. Muffley  
 Rebersburg, ..... Frank & Stover  
 Rebersburg, Spring Mills Creamery Co.  
 Spring Mills, .. Spring Mills Creamery  
 State College, .. State College Creamery

## Chester Co.

Anselma, ..... Pikeland Creamery  
 Avondale, ..... Lamborn's Creamery  
 Brandywine Manor, .. Reid's Creamery  
 Buck Run, ..... Ercildoun Creamery  
 Cedar Knoll, ..... Lafayette Creamery  
 Chadd's Ford, .. E. Darlington & Bro.  
 Chesterville, ..... Marvell Bros.  
 Cochranville, ..... Cochran Creamery  
 Cochranville, .. Cochranville Creamery  
 Collamer, ..... Isaac Evans  
 Collamer, ..... W. Evans & Son  
 Collamer, ..... E. B. Herr  
 Cossart, ..... Brandywine Creamery  
 Cossart, ..... James B. Pyle  
 Doe Run, ..... H. A. Clark  
 Doe Run, ..... Darlington Creamery  
 Doe Run, ..... Milton Darlington  
 Doe Run, ..... H. A. Taylor  
 East Coventry, ..... East Coventry Creamery

Elk View, ..... Dr. Quimby  
 Elk View, ..... T. Thomas Webb  
 Embreeville, ..... J. L. Cunningham  
 Fairville, ..... Sharpless Creamery  
 Font, ..... Fairmont Creamery  
 Glen Roy, ..... E. B. Herr  
 Hickory Hill, Hickory Hill Creamery  
 Homerville, ..... Collamer Dairy  
 Honeybrook, .. C. D. & P. H. Emery  
 Honeybrook, .. Pennsylvania Creamery  
 Kelton, ..... S. Morris Jones  
 Keimberton, ..... Fry & Barr  
 Kembleville, ..... Byers' Creamery  
 Kembleville, .. Kembleville Creamery  
 Kennett Square, .. Bernard's Creamery  
 Kennett Square, ..... Kennett Square Creamery

Kennett Square, ..... Wm. Sharpless  
 Landenburg, ..... Alfred Sharpless  
 Lenover, ..... H. S. Boyd  
 Leonard, ..... Rosedale Creamery  
 Lincoln University, .... Niewig Bros.  
 Londonderry, ..... J. H. Donald  
 London Grove, ..... J. C. Sharpless  
 Marsh, ..... Marsh Creamery  
 New Garden, .. New Garden Creamery  
 New London, ..... Frank Kirk  
 New London, .. Theodore Kirk & Son  
 Nottingham, Nottingham Co-operative Creamery

Oxford, ..... Big Elk Dairies  
 Oxford, ..... Hill Crest Creamery  
 Oxford, ..... H. D. & E. A. Pugh  
 Oxford, ..... Geo. D. Woodside & Co.  
 Parksburg, ..... Cochran Creamery  
 Phoenixville, .... Red Bank Creamery  
 Pughtown, ..... D. Wadleigh  
 Pomeroy, ..... M. Darlington Sons  
 Roberts, ..... Thomas Hatfield & Son  
 Russellville, .... Russellville Creamery  
 St. Peters, ..... Farmers' Creamery  
 Schuylkill, ..... Schuylkill Creamery  
 Shceder P. O. James C. Roberts & Son

Sheeder, ..... Vincent Creamery  
 Spring City, ... Spring City Creamery  
 Supplee, ..... Enterprise Creamery  
 Toughkenamon, ..... Josiah Lamborn  
 Toughkenamon, ..... Wm. Sharpless  
 Tweedale, ..... E. B. Herr  
 Unionville, ..... Unionville Creamery  
 Vincent, ..... Brindlinger Bros.  
 Vincent, ..... E. B. Gasher  
 Vincent, ..... R. Heistand  
 Wagontown, .... J. H. Schrock & Son  
 Wagontown, ..... Harry Schrack  
 Wagontown, .... West Cain Creamery



## Chester Co.

Warwick, .....Marst Creamery  
 West Chester, .....Allerton Creamery  
 West Vincent, .....Lewis H. Evans  
 West Chester, .....Harper Creamery  
 West Chester, George Fauetts & Son  
 West Chester, .....Wm. B. Harvey  
 West Chester, .....Homestead Creamery  
 West Chester, West Chester Creamery  
 West Chester, ...West Chester Dairy  
 West Chester, ..E. Roberts' Creamery  
 Whitford, .....Whitford Creamery  
 Whitford, .....Arnold M. Wilber  
 Williams' Corners, ..Chas. Buckwalter  
 Williams' Corners, ..Morris Maekissic  
 Willowdale, ....Willowdale Creamery  
 Wrightsdales, ...Wrightsdale Creamery

## Crawford Co.

Beaver Centre, .....Clark & Gates  
 Conneautville, .....J. W. Clark  
 Centreville, .....Centreville Creamery  
 Beaver Centre, ..Green, Clark & Co.  
 Crossingville, ..Crossingville Creamery  
 Dicksonburg, .....T. S. Layer  
 Espyville, .....A. W. Wall  
 Frenchtown, .....Augustus Polley  
 Guys Mills, .....L. C. McGraw  
 Jewell, .....Jewell Cheese Factory Co.  
 Jewell, .....N. O. Stanford  
 Hickernell, .....Hickernell Creamery  
 Lincolnville, ....Lincolnville Creamery  
 Linesville, .....A. B. Griffin  
 Long's Stand, .....A. J. Miller  
 Meadville, Leon C. McGraw Cheese Co.  
 Miller's Station, .....L. C. McGraw  
 Penn Line, .....L. C. McGraw  
 Pinney Corners, .....D. H. Nodine  
 Rundell's, .....McGraw & Cooper  
 Saegerstown, .....A. B. Long  
 Saegerstown, .....Long & Reiehe  
 Spartansburg, .....Coneord Creamery  
 Spartansburg, .....Hyde and Baker  
 Springboro, .....J. J. Howard  
 Townville, .....A. L. Squier  
 Troy Centre, .....Grove & McDowell  
 Troy Centre, ...Troy Centre Creamery  
 Westford, .....J. S. Martin  
 Westford, .....Hart Espy  
 Woodcock, .....Sherrod & Norris

## Clarion Co.

Callensburg, ....Callensburg Creamery  
 Liekingville, ....Pioneer Creamery Co.  
 Marble, .....Enterprise Creamery  
 Newmansville, ..Pioneer Creamery Co.

## Clearfield Co.

Clearfield, ....Clearfield Creamery Co.  
 Clearfield, .....James Mitchell

## Clinton Co.

Clintondale, Clintondale Creamery Co.  
 Loganton, .....Loganton Creamery  
 Salona, .....Salona Creamery

## Columbia Co.

Berwick, .....Fairview Creamery  
 Millville, .....Millville Creamery

## Cumberland Co.

Allen, Cumberland Valley Creamery Co.  
 Allen, .....John Hoemer  
 Boiling Springs, ....Wm. H. Kunkel  
 Carlisle, .....Letort Creamery  
 Craighead, .....B. W. Hasler  
 Hatton, .....Keystone Creamery  
 Meehaniesburg, ....Cumberland Valley  
 Meehaniesburg, .....Meehaniesburg  
 Meehaniesburg, .....Meehaniesburg  
 New Kingston, ...Cumberland Valley  
 New Kingston, .....New Kingston Creamery

Newville, .....Big Springs Separator  
 Shippensburg, ....D. B. Biggs & Son  
 Shippensburg, .....Jacob Reigle  
 Williams' Mills, ..Cumberland Valley  
 Williams' Mills, .....Geo. Umberger

## Dauphin Co.

Berrysburg, .....Peter L. Stine  
 Deodate, .....Ezra C. Foltz  
 Fisherville, .....Cornelius Bixler  
 Fisherville, .....Fisherville Creamery  
 Grantville, .....Stauffer & Rapp  
 Harrisburg, .....S. F. Barber  
 Hummelstown, .....Model Creamery  
 Millersburg, .....C. F. Moyer  
 Powl's Valley, .....C. Bixler & Son  
 Progress, .....John H. Sheesly  
 Swatara, .....Conewago Creamery  
 Union Deposit, .....Stauffer & Rapp

## Delaware Co.

Brandywine Summit, Miller & Heyburn  
 Chadd's Ford, ...E. Darlington & Bro.  
 Cheney, .....Thomas Cheney  
 Cheney, .....Frank G. Thomas  
 Coneordville, .....P. E. Sharpless  
 Darling, .....Darlington Creamery  
 Darlington, ..M. F. Darlington & Son  
 Villanova, .....Villanova Creamery  
 Wallingford, ..Wallingford Creamery  
 Wallingford, ..Wallingford Dairy Co.  
 Ward, .....Pennoek E. Sharpless

## Elk Co.

Ridgway, .....Ridgway Creamery Co.  
 St. Mary's, .....St. Mary's Creamery

## Erie Co.

Albion, .....W. S. Boyle  
 Corry, .....Corry Creamery  
 Corry, .....J. C. Wales  
 Edinboro, .....Lavery & Co.  
 Elgin, .....Pier Willard  
 Ferdinand, W. Union Cheese Factory  
 Franklin Corners, ....Frank Billings  
 Greenfield, ....Greenfield Butter and  
 Cheese Co.

Ivasea, ...Population Cheese Faactory  
 Itley, .....William Marsh  
 Juva, .....Barnes & Lockwood  
 Lavery, .....J. S. Lavery  
 LeBoeuf, .....C. M. Wheeler  
 Lovell's Station, ...Crowells McCray  
 Loysville, Dickinson, Gilbert & Keen  
 McLane, .....Wm. Marsh  
 Mystie, .....J. H. Waterhouse  
 Ovid, .....Mark L. Howard  
 Phillippsville, .....Alfred Moore  
 Pont, .....R. B. Gates  
 Sterrettania, .....Joseph H. Ha-eh  
 Sterrettania, ..Sterrettania Creamery  
 Tellar, .....C. D. Faulkner  
 Union City, .....Geo. W. Carroll  
 Wattsburg, .....F. W. Edmunds  
 Wattsburg, ...Keystone Creamery Co.  
 Waterford, .....Sharps Creamery  
 Waterford, .....J. H. Brogdon  
 Wattsburg, .....Pratt Bros.  
 Waterford, .....Vananden & Gillit  
 Waterford, .....O. H. Wells

## Fayette Co.

East Riverside, .....M. R. Jacobs  
 Farmington, .....Cheese Factory  
 New Haven, New Haven Butter Co.

## Franklin Co.

Chambersburg, ....Hanover Creamery  
 Chambersburg, .....Chambersburg  
 Chambersburg, .....Chambersburg  
 Edenville, .....Franklin Creamery Co.  
 Green Village, .....H. Foglesong



## Franklin Co.

Green Castle, .....F. W. Kulin  
 Green Village, Green Village Creamery  
 Lemaster's, ...J. R. Lemaster & Son  
 Macion, ...Cumberland City Creamery  
 and Dairy  
 Markes, .....J. R. Lemaster & Son  
 Mercersburg, ..Mercersburg Creamery  
 Co.

Shady Grove, ...Nicodemus Creamery  
 Assn.

Waynesboro, Blue Mountain Creamery  
 Waynesboro, .....A. L. Schailer  
 Waynesboro, .....Chas. H. Stichel  
 Williamson, ...Williamson Farmers'  
 Co-operative Creamery

Williamson, Williamson Creamery Co.  
 Willow Hill, .....McCurdy & Elder

## Fulton Co.

McConnellsburg, .....W. L. Sloan  
 McConnellsburg, .....McConnellsburg  
 Creamery

## Greene Co.

Carmichaels, ...Carmichaels Creamery

## Huntingdon Co.

McAlevy's Fort, .....McAlevy's Fort  
 Creamery

Morrell, Morrell Butter and Cheese Co.  
 Neff's Mills, ....Neff's Mills Creamery  
 Pennsylvania Furnace, Hoffman Bros.

## Indiana Co.

Elder's Ridge, Co-operative Creamery  
 Co.

Homer City, .. .....H. C. English  
 Homer City, ...Homer City Creamery

## Jefferson Co.

Sugar Hill, .....J. N. Atwell & Co.

## Juniata Co.

Cocolamus, .....Brown & Co.  
 East Salem, .....S. Schlegel  
 East Salem, ...East Salem Creamery  
 McAllisterville, Shellenberger & Ham-  
 bright

McCoysville, .....B. C. Cubbleson

## Mifflintown, .....J. G. Haldeman

Port Royal, ....Port Royal Creamery

Thompsontown, .....J. G. Haldeman

## Lackawanna Co.

Glenburn, .....Enderly Dairy

Ia Plume, .....Scranton Creamery

Moscow, .....Moscow Creamery

Scranton, .....Wm. Conrad

Scranton, .....E. S. Decker

## Lancaster Co.

Bainbridge, .....Coday Creamery

Bart, .....Bart Creamery

Bethesda, .....Bethesda Creamery

Bird-in-hand, ..Bird-in-hand Creamery

Bird-in-hand, .....F. Bowman

Blue Ball, .....S. H. Musselman

Buck, .....Buck Creamery

Cambridge, .....Cambridge Creamery

Cambridge, ....E. J. & P. H. Emery

Cambridge, .....George I. Emery

Christiana, .....Christiana Creamery

Cocalico, .....Cocalico Creamery

Colemanville, .....George Garret

Collens, .....Herr & Maull

Denver, .....Daniel Gebble

Elizabethtown, .....Elizabethtown  
 Creamery

Ephrata, .....J. H. Yeiser

Fairland, .....John Reist

Farmersville, .....Henry J. Shaffer

Fertility, ....Fertility Creamery Co.

Florin, .....Florin Creamery

Furniss, .....C. P. Grigg

Gap, .....Gap Creamery Co., Ltd.

Glenola, .....Johnsonville Creamery

Glenola, .....H. M. Stauffer

Goshen, .....The Elam Dairy Co.

Goshen, .....Goshen Creamery

Goshen, .....Amos Walton

Hahnstown, .....John Fry's Sons

Kirkwood, .....Ezra Hess

Kirkwood, .....Graybill Stone

Lancaster, .....Lancaster Dairy Co.

Landisville, .....Levi H. Hershey

Landisville, ....Landisville Creamery

Lititz, .....Garber Reist & Co.

Manheim, .....Hershey Bros.

Martillville, .....M. C. Eshelman

Mascot, .....Stumptown Creamery

Mastersonville, Farmers' Creamery Co.

Mastersonville, Mastersonville Cream-  
 ery Assn.

May, .....Johnson & Gilbert

McSparran, ...Peters' Creek Creamery

McSparran, .....Willowdale Creamery

Mt. Joy, ....Farmers' Creamery Co.

Mt. Joy, .....Reist, Nissley & Son

Mount Nebo, Mt. Nebo Creamery Assn.

New Providence, ..Dickinson & Gilbert

Octararo, .....J. H. Brosius

Pleasant Grove, .....Carter & Mills

Pleasant Grove, Conowingo Creamery

Quarryville, ....Dickinson & Gilbert

Quarryville, ....Quarryville Creamery

Reinhold Station, ....Reinhold Station  
 Creamery

Smithville, Harry S. Wiggling & Co.

Smyrna, .....Smyrna Creamery Co.

Spruce Grove, .....Milton Keech

Unicorn, .....Unicorn Creamery Co.

Unicorn, .....J. E. Moore

White Rock, .....Elm Creamery Co.

White Rock, .....Wm. G. Patton

White Rock, White Rock Creamery Co.

Windom, ....Champion Creamery Co.

## Lawrence Co.

Enon Valley, Enon Valley Creamery

Neshannock Falls, ..Neshannock Falls  
 Creamery

New Castle, ....Midway Butter Co.

Pulaski, .....John S. Evans

Volant, .....J. Wilken & Son

## Lebanon Co.

Bellgrove, .....Cleona Creamery Co.

Campbellstown, .....Campbellstown  
 Creamery

Cleona, .....Cleona Creamery

Fontana, .....Cleona Creamery Co.

Fredericksburg, .....L. S. Gearhart

Jonestown, .....Z. T. Gingrich

Lawn, .....Lawn Creamery Co.

Lebanon, .....City Creamery

Millbach, .....Millbach Creamery Co.

Myerstown, .....Basler Creamery

Myerstown, .....George W. Dongs

Myerstown, .....Mengle & Yost

Ono, .....L. S. Gerhart

Palmyra, Elizabethtown Creamery Co.

Prescott, .....Henry Haak

Richland Station, .....Big Spring  
 Creamery Co.

Richland Station, ...G. E. Brownback

Richland Station, .....Henry Haak

## Lehigh Co.

Alburtis, Spring Creek Creamery Co.

Allentown, ...Spring Creek Creamery

Allentown, .....Lux Creamery Co.

Catasauqua, ....Howerton Creamery

Coopersburg, .....W. H. Steininger

Coopersburg, .....Landis & Co.

- Lehigh Co.  
 Hosensack, .....L. H. Brownell  
 Hosensack, .....Hosensack Creamery  
 Lanark, .....J. C. Richard  
 Lyon Valley, ..Lyon Valley Creamery  
 Lyon Valley, .....M. C. Rollman  
 Macungie, .....E. M. Laux & Co.  
 Macungie, .....Macungie Creamery  
 Macungie, .....Schuler Bros.  
 New Tripoli, .....Miller & Gilmer  
 Plover, .....W. R. Schuler  
 Sigmund, .....Jacob Faust & Co.  
 Steinsville, .....Steinsville Creamery  
 Vera Cruz, .....Schuler Bros.  
 Vera Cruz, .....Vera Cruz Creamery  
 Wanamaker, .....John K. Fetherolf  
 Werley's Corner, .....O. P. Werley
- Luzerne Co.  
 Hazleton, .....Rhone Trescott  
 Hazleton, .....J. M. Williams  
 Wilkes-Barre, Standard Dairy Co., Ltd.  
 Wapwallopen, Wapwallopen Co-operative Creamery Co.
- Lycoming Co.  
 Jersey Shore, .....J. M. Harmon  
 Larrys Creek, .....Geo. L. Randall  
 Muncy, .....David Gundsum  
 Muncy, .....Muncy Creamery  
 Roaring Branch, .....E. E. Harrer  
 Roaring Branch, ..American Creamery Co.
- McKean Co.  
 Eldred, .....Eldred B. & C. Co.  
 Kane, .....Kane Creamery Co.  
 Myrtle, .....R. G. Wooden  
 Port Allegany, ...Acme Creamery Co.  
 Smethport, .....Naundah Butter & Creamery Co.
- Mercer Co.  
 Greenville, ...Greenville Creamery Co.  
 Grove City, ...Library Grove City Coll  
 Grove City, .....A. H. Beatty  
 Indian Run, .....T. P. Munnell  
 Jamestown, .....W. R. Plant  
 Loudon, .....Loudon Creamery Co.  
 Mercer, .....Louden Creamery Co.  
 Mercer, .....McDonaldson & Zahiser  
 Mercer, ...Mercer Creamery Co., Ltd.  
 New Vernon, .....J. A. Carey  
 Sharpville, ....Sharpville Creamery  
 Volant, .....S. A. Williams
- Mifflin Co.  
 Allensville, ..Allensville Creamery Co.  
 Belleville, .....Belleville Creamery  
 Mattawana, ...Mattawana Creamery  
 McVeytown, ....John M. Hassinger,  
 Reedsville, .....D. Z. Detweiler  
 Reedsville, .....A. L. Detweiler  
 Reedsville, .....Reedsville Creamery
- Monroe Co.  
 East Stroudsburg, .....Beechpond Creamery Co.  
 Gilbert, .....M. G. Funk  
 Lamartine, .....Salem Creamery Co.  
 Limstone, .....Greenville Creamery  
 Stroudsburg, ..Stroudsburg Creamery Co.
- Montour Co.  
 Washingtonville, Mengle & Luckenbill
- Montgomery Co.  
 Cedars, .....J. P. Bustard  
 Colmar, .....Colmar Creamery  
 Colmar, .....John Holley  
 Congo, .....Congo Creamery  
 Creamery, ....Perkionen Dairymen's Assn.  
 Earlington, .....H. C. Durstien
- Earlington, .....J. G. Hunsicker  
 Earlington, .....John Landis  
 East Greenville, East Greenville Cream  
 East Greenville, .....Adam Kraus  
 Fairview Village, ...Fairview Village Creamery Assn.  
 Franconia, .....J. N. Freed  
 Franconia, ...Indian Creek Creamery  
 Franconia, .....John K. Landis  
 Frederick, .....Green Tree Creamery  
 Grater's Ford, .....A. G. Fly  
 Grater's Ford, Grater's Ford Cream. Co.  
 Hatfield, .....Drake's Ford Creamery  
 Hatfield, .....Aaron Tyson  
 Hillegas, .....Hillegas Creamery Co.  
 Hoppenville, ...McLean's Creamery  
 Hoppenville, .....J. T. Moyer  
 Iron Bridge, .....Harmony Grange Creamery  
 Kulpsville, Towamensing Creamery Co.  
 Lederachville, .....Andrew T. Garber  
 Lederachville, Wide Awake Creamery  
 Lederachville, ...Worcester Creamery  
 Limerick, .....Garret E. Brownback  
 Limerick, .....Samuel Y. Eisenberg  
 Linfield, .....G. E. Brownback  
 Linfield, .....Samuel Y. Eisenberg  
 Linfield, .....P. J. Reifsnnyder  
 Lucon, .....Lucon Creamery Co.  
 Mainland, ...Mainland Creamery Co.  
 Narcissa, Plymouth Valley Creamery  
 North Wales, .....C. W. Hoffman  
 Obelisk, Green Tree Dairymen's Assn.  
 Perkiomenville, .....J. M. Reed  
 Pottstown, .....S. G. Fly  
 Pottstown, ...Miller Bros. Creamery  
 Prospectville, ..Prospectville Creamery Co.  
 Royersford, .....Mingo Creamery  
 Salfordville, Upper Salford Creamery  
 Sanatoga, .....Sanatoga Creamery  
 Sassmansville, Sassmansville Creamery Co.  
 Schwenkville, .....William Brömer  
 Schwenkville, ...Dairymen's Creamery Assn.  
 Schwenksville, .....Wm. G. Liegler  
 Skippack, ...Schwenksville Cry. Assn.  
 Spring House, .....R. R. Jones  
 Trappe, .....Spring Valley Creamery  
 Willow Grove, Willow Grove Creamery  
 Worcester Farmers' Creamery Assn.  
 Yerkes, .....Yerkes Creamery
- Northampton Co.  
 Bath, .....W. H. Landis  
 Benningers, W. M. Benninger & Son  
 Bingen, .....Campbell & Appel  
 Bushkill Centre, ....Bushkill Centre Creamery  
 Butztown, .....Butztown Creamery  
 Cherryville, .....L. D. Meckley  
 Hecktown, .....Hecktown Creamery  
 Hecktown, .....W. H. Landis  
 Hecktown, .....S. D. Steuben  
 Moorestown, .....H. S. Kratz  
 Nazareth, .....H. S. Kratz  
 Nazareth, ...Nazareth Creamery Co.  
 Petersville, .....William A. Slot  
 Plainfield, .....Plainfield Creamery  
 Stockertown, ..Stockton Creamery Co.  
 Stone Church, ....W. M. Benninger  
 Stone Church, .....Jordon McIntyre  
 Walnutport, .....W. M. Benninger  
 Weaversville, .....Dairymen's Assn.  
 Weaversville, .....William M. Smith  
 Youngs, .....Frank Young



## Northumberland Co.

Chillisquaque, .....C. L. Butler  
 Dewart, .....Dewart Creamery Co.  
 Milton, Pleasant Valley Creamery Co.  
 Montandon, ...Cold Spring Creamery  
 Sedau, .....Wm. Dunn  
 Sunbury, .....Chas. R. Rinehart  
 Sunbury, .....Sunbury Creamery Co.

## Perry Co.

Elliottsburg, .....E. J. Kistler  
 Loysville, .....Loysville Creamery Co.  
 Millerstown, .....J. C. Kipp

## Pike Co.

Matamoras, ....Matamoras Creamery

## Potter Co.

Bingham Centre, .....W. J. Clark  
 Bingham Centre, .....R. H. Howe  
 Bingham Centre, .....Richard Labor  
 Elmer, .....Cheese Factory  
 Newfield, .....W. J. Grover  
 Raymonds, .....E. J. Conable  
 Raymonds, .....W. B. Perkins  
 White's Corners, .....White's Corners  
 Creamery

## Schuylkill Co.

Orwigsburg, .....A. F. Kimmel  
 Rauch's, .....Salem W. Koch  
 Tamaqua, .....Henry M. Enterline

## Snyder Co.

Beaver Springs, Beaver Springs Cream.  
 Globe Mills, ...Palmer & Hackenburg  
 McClure, .....Ulsh & Bro.  
 Middleburg, ...Palmer & Hackenburg

## Susquehanna Co.

Alford, .....Alford Creamery  
 Auburn Centre, Shaunou Hill Co-op.  
 Creamery

Auburn 4 Corners, Auburn 4 Corners  
 Creamery Co.

Birchardville, .....C. P. Ball  
 Birchardville, Birchardville Creamery  
 Birchardville, Excelsior Creamery Co.  
 Brooklyn, .....Brooklyn Creamery  
 Chocout, Chocout Valley Creamery  
 Co.

Dimock, .....Dimock Creamery Co.  
 East Rush, East Rush Creamery Co.  
 East New Milford, ...Mountain Lake  
 Creamery Co.

Fairdale, .....C. P. Ball  
 Fairdale, .....Fairdale Creamery  
 Fairdale, .....Seller Bros.  
 Forest Lake, Forest Lake Creamery  
 Co.

Franklin Forks, Franklin Forks Cream.  
 Gibson, .....Hartford Dairy Co.  
 Heartlake, .....Heartlake Creamery  
 Hartford, .....Hartford Dairy Co.  
 Hop Bottom, Hop Bottom Dairy and  
 Milk Co.

Hop Bottom, Hop Bottom Creamery  
 Kingsley, Kingsley Creamery Co., Ltd.  
 Kingsley, ...Kingsley Union Creamery  
 Kingsley, .....Robinson Wollworth &  
 Kingsley

Lawesville Centre, ..Lawesville Co-op.  
 Creamery Co.

Little Meadows, Iron Bridge Creamery  
 Little Meadows, ....Little Meadows  
 Creamery

Middletown, Iron Bridge Creamery Co.  
 Middletown Centre, Middletown Centre  
 Creamery Co.

Montrose, .....Montrose Dairy Co.  
 Moutrose, .....Seller Bros.  
 Montrose, .....Beech Bros.  
 Montrose, .....Beebe Creamery  
 Montrose, .....Silver Lake Creamery

New Milford, ..Kingsley Creamery Co.  
 New Milford, New Milford Creamery  
 Co.

Rush, .....Rush Centre Creamery Co.  
 Rushboro, .....Treasurer  
 Rushboro, Jersey Hill Creamery Co.  
 Rushboro, ...East Rush Creamery Co.  
 Rushville, ...Rushville Creamery Co.  
 Silver Lake, ..Quaker Lake Creamery  
 Springville, ....Springville Creamery  
 South Gibson, ...Hartford Dairy Co.  
 Tiffany, .....Tiffany Creamery  
 Thompson, .....Thompson Creamery

## Tioga Co.

Austinburg, .....E. A. Bean  
 Austinburg, .....Cheese Factory  
 Balsam, .....Balsam Cheese Factory  
 East Chatham, .....D. Avery  
 Elkland, .....Elkland Creamery  
 Elkland, .....Cheese Factory  
 Job's Corners, ..William G. Carpenter  
 Keeneyville, .....A. C. Close  
 Keeneyville, .....Cheese Factory  
 Knoxville, .....E. A. Dean  
 Knoxville, Pennsylvania Creamery Co.  
 Knoxville, .....Cheese Factory  
 Lawrenceville, Lawrenceville Creamery  
 Liberty, .....Worlin Miller  
 Liberty, Liberty Valley Creamery Co.  
 Little Marsh, .....W. Wass & Co.  
 Little Marsh, .....Cheese Factory  
 Mansfield, .....Pitts & Spurr  
 Mansfield, ...West Sullivan Creamery  
 Nelson, .....J. B. Campbell  
 Nelson, .....Nelson Cheese Factory  
 Nelson, Nelson Separator & Butter Co.  
 Round Top, .....E. A. Close  
 Rutland, .....Zimmer & Clark  
 Stony Fork, ...Stony Fork Creamery  
 Sylvester, .....E. O. Bean  
 Tioga, .....Kemp & Berg  
 Tioga, .....Tioga Cheese Factory  
 Wellsboro, .....G. B. Close  
 Westfield, ...Westfield Cheese Factory

## Union Co.

Lewisburg, ..Buffalo Valley Creamery  
 Midlinburg, Crystal Springs Creamery  
 Midlinburg, Midlinburg Creamery Co.

## Venango Co.

Oil City, .....M. B. Crowther

## Warren Co.

Ackley Station, .....Young & Clark  
 Bear Lake, .....Frank Parkhurst  
 Chandlers' Valley, ...Valley Creamery  
 Columbus, .....J. U. Wells  
 Garland, .....Garland Cheese Factory  
 Grand Valley, .....Valley Creamery  
 Lader, .....James Curtis  
 Lader, .....E. S. Griggs  
 Lottsville, .....Vern Grigg  
 Spring Creek, ..Willowdale Creamery  
 Sugar Grove, ...Acme Creamery Co.  
 Sugar Grove, .....George Hampson  
 Youngsville, Youngsville Creamery Co.

## Washington Co.

Bulger, .....Peter Hermes  
 Bulger, ...Ohio & Pgh. Milk Co.'s Cr'y  
 West Alexander, .....McCalmont &  
 Chambers  
 West Alexander, Jas. A. Chambers &  
 Co.

## Wayne Co.

Ariel, .....Lakeside Creamery  
 Beach Lake, ...Beach Pond Creamery  
 Clemo, .....Clemo Creamery Co.  
 Gravity, ...Gravity Co-op. Creamery  
 Gravity, .....Georgetown Creamery  
 Honesdale, ..Crystal Spring Creamery

## Wayne Co.

Newfoundland, Oakdale Co-operative  
Co.

Sulleyville, .....G. & C. Smith

Seeleyville, Silver Creek Creamery Co.

Starlight, .....Starlight Dairy Co.

## Westmoreland Co.

Greensburg, .....Chicago Dairy

Mt. Pleasant, ..Mt. Pleasant Creamery

New Kensington, ....Willis Wonderly

New Kensington, ....New Kensington

Butter Co.

Scott Haven, .....McGrew & Bros.

Smithton, .....Smithton Creamery

## Wyoming Co.

Factoryville, ...Factoryville Creamery

Factoryville, .....V. R. Gardner

Laceyville, .....Horseheads Creamery

Laceyville, Bradford Co. Creamery Co.

Lemon, .....Lemon Creamery

Nicholson, .....Nicholson Creamery

Nicholson, .....L. H. Pratt

Nicholson, .....Lackawanna Dairy

North Mehoopany, .....Vaugh Bros.

## York Co.

Big Mount, .....A. B. Mummert

Bridgeton, .....Bridgeton Creamery

Brodbecks, ..Brodbecks Sta. Creamery

Brodbecks, .....Miller & Bortner

Delta, .....Daniel Hollingsworth

Dillsburg, .....Dillsburg & Elgin

Dover, .....Dover Creamery

East Berlin, ...East Berlin Creamery

Felton, .....R. Grove & Brother

Gatchelville, ...Gatchelville Creamery

Glenville, .....Glenville Creamery

Hanover, .....Hanover Creamery

Hanover, ...York & Adams Creamery

Hanover, .....Reist, Nissley & Co.

Hanover, .....Hanover Produce Co.

Muddy Creek Forks, Pleasant Grove

Creamery

New Freedom, .....August J. Gillen

New Park, .....New Park Creamery

New Sinsheim, .....Israel K. Zeigler

Porter's Siding, .....C. C. Wooden

Railroad, .....J. A. Wetrick

Shrewsbury, ...Shrewsbury Creamery

South Beaver St. York, ....Mr. Budd

Spring Forge, .....Wagner & Swartz

Slate Hill, Cool Spring Creamery Co.

Slab, .....C. C. Smith & Bro.

Swartstown, ....Swartstown Creamery

Wellsville, .....T. C. Cleaver



